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ABSTRACT

Results of a needs assessment for administrative computing at the University of Nevada, Reno, are presented. The objectives of the Management Information Systems Task Force are identified, along with 17 problems in existing operational and management data systems, and institutional goals for future planning and management systems. In addition to common system needs, specific system needs are specified for data entry, processing, and reporting for the following areas: academic records and registration, student billing and accounts receivable, financial aid and student employment system, graduate school, housing assignment system, admissions, career planning and placement, foundation and alumni offices, and continuing education. Data entry, processing/system, and reporting requirements are also identified for the facilities/property/equipment inventory system, the controller's office, research development, research grant fiscal management, budget operation system, budget planning system, miscellaneous stores, purchasing system, central services and publications/graphics, police and parking, personnel and payroll, and affirmative action. A list of persons interviewed is appended. (SW)

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ED238335

A MANAGEMENT INFORMATION SYSTEMS NEEDS ANALYSIS

FOR THE UNIVERSITY OF NEVADA RENO

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HE 016 862

A MANAGEMENT INFORMATION SYSTEMS NEEDS ANALYSIS

FOR THE UNIVERSITY OF NEVADA RENO

prepared by
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October 3, 1983

A MANAGEMENT INFORMATION SYSTEMS NEEDS ANALYSIS
FOR
THE UNIVERSITY OF NEVADA RENO

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APPENDIX A: PEOPLE INTERVIEWED

UNIVERSITY OF NEVADA RENO

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September 27, 1983

MEMORANDUM

TO: Administrative Council - UNR
Management Information System Task Force - UNR
Management System Committee - UNS

FROM: Ashok K. Dhingra

SUBJECT: Administrative Computing Needs Assessment at the University of Nevada Reno

I am pleased to present to you the Administrative Computing Needs at the University of Nevada Reno prepared by the UNR Management Information System Task Force. Dr. Fritz Grupe provided key assistance in the completion of this fine document.

Various members of the university community participated in the development of the document, and I would like to thank them all for their support. This document represents the preliminary needs assessment at UNR which will now be provided to the outside consultant being hired by the UNS Management System Committee for the completion of the formal needs assessment at the UNS level. It is my understanding that this final document which covers the needs assessment, as well as, the schedule/costs for the implementation of MIS for the University of Nevada system will be ready by the end of January.

In the review of this preliminary document, if you have any comments or suggestions for improvement, please do not hesitate to contact me. In closing, I would like to offer my sincere thanks to the members of the MIS Task Force at UNR, with a special thanks to Dr. Fritz Grupe for doing such an excellent job in the development of the enclosed document and to Nancy Taylor for her diligence in proofreading and the preparation of the document for publication.

AKD:sg

cc: President Joe Crowley
Chancellor Robert Bersi
Bill Cathey, Faculty Senate Chairman

I. INTRODUCTION

I. INTRODUCTION

A. The University of Nevada Reno

The University of Nevada Reno is one of seven institutions within the University of Nevada System and is located in the city of Reno in northwestern Nevada. It is a public land grant institution with diverse programs in instruction, research and public service.

Enrollments at the University have continued to increase slightly each year in recent years. The head count enrollment is currently approximately 9,500. This includes around 7,200 undergraduate, 1,700 graduate and another 600 non-degree students.

Nearly 2,000 courses are offered in support of seven associate, 71 baccalaureate and 94 graduate degree programs. Majors are offered by colleges and schools of agriculture, arts and science, business administration, education, engineering, home economics, medicine, mining and nursing.

The University has over 60 buildings on a campus of roughly 200 acres. It employs over 1550 persons in instructional, administrative and classified positions. The annual budget for the University is around $70 million.

As a major institution of higher education, state-of-the-art management techniques must be employed in order to assure that the citizens of Nevada continue to receive excellent educational programs which are administered effectively and efficiently.

B. The Management Information Systems Project

In January of 1983, the Board of Regents initiated a project to develop an integrated planning and management system. The project was proposed by the Chancellor in response to internal and external questions about the effectiveness of current computerized information systems, especially in the financial area.

As the project developed, a contract was effected with the Burroughs Corporation under a joint venture agreement. The agreement was designed to enable the University of Nevada System to develop a system cooperatively with Burroughs and Burroughs' subsidiary, Midwest Systems Group. An overall expenditure of between $4 to $8 million was estimated to be required for system development.

Consultants from the Higher Education Management Institute were contracted to initiate needs analyses at the seven system units which include: University of Nevada Las Vegas, University of Nevada Reno, Clark County Community College, Northern Nevada Community College, Truckee Meadows Community College, Western Nevada Community College and Desert Research Institute. On August 4, 1983, it was decided by the UNS Management System Committe overseeing the project that each unit would complete the needs analysis process for itself. An initial report from each unit was due by mid-September. This report is the outcome of the UNR needs assessment process.

Concurrent with the completion of the seven needs analyses, a request for proposal was issued for consultative assistance in the determination of system specifications, implementation plans, and estimated software design costs and schedules. The consultant firm selected will work on these tasks from October 1 to January 1. Upon completion of these specifications, Burroughs will begin the system coding and testing.

C. The University of Nevada Reno Needs Analysis Process

A campus committee, the Management Information Systems Task Force, has coordinated the needs analysis process at the University of Nevada Reno. Its functions, however, go beyond the determination of needs since this committee relates directly to the UNS Management Systems Committee on a continuing basis and all of that committee's planned activities. The objectives of the MIS Task Force are:

1. To identify the information required for management of the University,

2. To identify the data required for the development of management information used by the University.

3. To identify those kinds of data which are suitable for efficient information extraction using a computer information system.

4. To prioritize the goals for management information systems of the campus,

5. To collect and analyze data on the current state of management information systems available to UNR,

6. To identify weaknesses of the existing management information systems,

7. To recommend alternatives for improvements in the management information systems and in management procedures, organization, personnel, budgetary and equipment considerations,

8. To determine institutional resource requirements for implementing existing and proposed systems,

9. To create such sub-committees as may be required to address specific problems,

10. To oversee the specification, design and implementation of management information systems unique to this campus, or to react to systemwide specifications, designs and implementation plans,

11. To evaluate the technical and economical validity of proposed and implemented systemwide and campus changes in management information systems.

12. To maintain communication and planning coordination with the academic computing user groups on campus and in the System.

The MIS Task Force is composed of persons representing the diverse groups on campus who have a need to know about and who need to have a voice in the systems to be implemented.

The MIS Task Force consists of Dr. Roberta Barnes, Dean of Student Services; Ms. Dana Edberg, Accounting and Information Systems Department; Dr. Fritz Grupe, Computer Services Coordinator; Dr. Richard Hughs, Dean of College of Business Administration; Dr. Owen Knorr, Director of Institutional Analysis; Dr. John Marschall, Director of University Services; Mr. Ashok Dhingra, Vice President for Finance and Administration; Mr. Dan Pease, Director of Financial Services; Ms. Joanne Ray, Personnel Analyst; Dr. Jack Shirley, Director of Admissions, Registrar; Dr. James Taranik, Dean of Mackay School of Mines; and Dr. Tracy Veach, Director of Evaluation Services, School of Medicine.

Appendix A identifies all of the people who attended small group meetings to assess the needs of their management area and/or persons who were interviewed to obtain follow-up information.*

A draft statement of the first round of campus needs assessment discussions was subsequently prepared and circulated for reaction and response. This document is the result of that review.

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* The University benefitted from a comparable study, Request for a Proposal for an Administrative Information and Management System for the Pennsylvania State University, July 10, 1981, completed by Pennsylvania State University, which was used as a starting point for subgroup discussions.

D. Management and Management Information Systems

In order to design and implement effective management information systems, managers need to examine their own responsibilities carefully. Their assessment of needs, based on these responsibilities, can only be useful if they are aware of the types of activities which they engage in and if they are able to assert the difficulties they have with currently available management information systems.

In the small group discussions and in interviews, managers were reminded that their tasks could be divided into five categories: planning, organizing, directing, controlling and evaluating. These tasks can be supported by computer systems but they need not be. Those that can be computerized fall, in one analysis, into one of three forms of system.

1. Operational data systems -- Systems that focus on the collection, recording and retrieval of specific data regarding individual transactions and entities. This might include such systems as those used to support the issuance of mailing lists, departmental accounts, class lists, work orders, etc. Information about the transactions and entities being described can generally be characterized as repetitive and predictable, and the reports desired are generally known to be required at fixed periods.

2. Management information systems -- Systems that summarize and analyze the data stored as a consequence of the use of operational data systems. Although management information systems are also typically repetitive and predictable, they generally deal with longer time scales than do operational data systems. Such systems could include program costing analyses, space utilization studies and statistical summaries.

3. Planning and management system -- Systems which are developed to describe phenomena that are not adequately described by current data. Forecasts and projections, intercollege comparisons of costs and the solution of "what if" questions fall into this category. Often these systems are developed in response to ad hoc questions that may never be asked again. These systems also require data (real or assumptions) that do not originate with the operational data systems.

Managers at different levels of the organization have varying needs for access to these systems. Executives require planning support frequently, management information systems less often, and operational data seldom. Middle-level managers require planning support occasionally, management information systems frequently, and operational data systems regularly. Lower-level managers have a frequent use of operational data

systems, and little use for planning and management systems and management information systems.

In conducting the needs analysis, managers were asked to identify systems that went beyond the number of operational data systems, and more limited numbers of management information systems available now, and to suggest these for inclusion in this report. It was recognized that the presence of new types of software such as report generators, inquiry languages, program generators and data base query languages would, when available, raise new possibilities as the software was used. Hence, the flexibility of these support packages is expected to cause modifications in the future as our vision expands, but these changes should be easily accommodated.

E. Current Problems

Operational data systems and management information systems that are currently available play an important role in the management of the University. Built up over many years many of the files and programs which are being used serve their defined purposes very well. Indeed, some managers indicate that some systems ought not to be changed at all since they function so well. Time did not permit an evaluation of existing programs, but it is assumed, if it is not re-stated, that the needs met by existing programs are expected to be met by the new system.

Despite the value of all these files and programs, problems with them were noted as being experienced by many respondents during this needs analysis. Problems and difficulties cited, however, do not reflect upon the adequacy of the programs but upon a technology that is being perceived as unsatisfactory as managers have become aware of the advancing capabilities of computers and have begun requesting services and changes that are not easily accommodated. Among the difficulties noted are the following:

1. Substantial time delays in new program development and in old program maintenance. Many users indicated their frustration when they indicated that new applications were needed but found that implementation was, if not impossible, likely to take two to three years.

2. Inability to use all data available, or inability to put the data into a form that solves a problem. Not untypical of file-based systems, managers are often aware that the "data is there" but they've been told that the development of a computer system to put the data into a suitable form, or to analyze the data, will require such substantial programming that either the unit will have to wait a long period of time or the unit will have to pay the programming costs involved. In other cases reports are so overly detailed that important information cannot be identified or inferred easily.

3. "Shadow files," "soft ledgers," hand filing and retrieval, hand posting of data and other manual data procedures are duplicating computer systems. Offices with strong needs to use their data to control procedures or to have up-to-the-minute data are now incurring major costs in keeping their own records on budgets and other data because of their inability to obtain reports on a day-to-day basis, or even a timely manner.

4. Current programs do not support the making of key management decisions. Middle managers obtain data and analyses that are essentially retrospective. Planning and forecasting facilities are not present. Computerized

information is often a departmental rather than a university resource.

5. Data is not always available in a time frame that meets management needs. In addition to budget ledgers, class lists, budgeting information and other data is frequently unavailable for such long periods that when it becomes available, its utility has decreased.

6. Data from different offices is not integrated. Periodically data originating with different offices is stored in a manner that does not permit integration in a new form. Scholarship and financial aid data, for instance, is stored separately so that a complete picture of a student's total support package is not available.

7. Data from different offices is not accessible to all offices which need and ought to be permitted to use this data. Printed reports housed in one location are not generally available at other locations. Advisers needing access to a student's course data does not have this data on-line, for example, and a departmental budget is not available on-line to a dean.

8. Data entry is cumbersome. Original data entry is batch-oriented which is slow to be completed. Forms are not generally computer readable. Existing information on files such as the ACT/SAT tapes or on student records are not easily transferred to new files (for the School Relations or Alumni Affairs offices, respectively).

9. The hardware in use is cited as discouraging some users. System down-time, limited port access and the rejection of terminals on-line for 30-45 minutes limit the ability of users to feel confident about the computer's reliability.

10. New information demands and questions of a unique nature are hard, if not impossible, to deal with expeditiously. Ad hoc questions asked by legislators, managers and others, despite the presence of the data, cannot be answered because the time involved may be short and the programming costs great. Historical comparisons and solutions that involve external data and assumptions are often done manually.

11. Management controls are hampered by the absence or inadequacy of data. Whether one deals with budgetary controls, position controls or other methods of tracking and evaluating processes within the University, the inability of the current system to accept new forms of data or new analytical techniques on a timely basis limits management effectiveness and encourages non-data-based decision

making. Also exception reports of different types are not generally present.

12. Except for the growth in word processing, many office automation capabilities are not yet implemented. Calendar searching for the scheduling of meetings, electronic mail, computer graphics for display of data, optical character reading and other forms of office support do not exist in any general way. Also unnecessary and faulty paper handling is encouraged by the absence of computer systems.

13. Errors in data entry occur due to multiple handling of data. Excessive handling of paper and keying from documents increases the chance that errors will be fostered.

14. Offices with high turn-over do not keep data bases complete and programs are not used effectively. People forget or don't always know how to use existing systems because documentation may be poor or because a system does not exist.

15. Duplicate data records kept by different offices often do not coincide. There may be official, but there are few authoritative, data bases since departments keeping their own records, especially in the area of student records, cannot reconcile their records with the records of other offices which gather data in by different means.

16. Data prepared for one report is not easily reinterpreted and formatted for preparing a similar report. Reports, for instance, designed to meet data definitions for the Higher Education General Institutional Survey are not precisely the same as those matching the University's structure so an interpretation must be re-assembled if a locally useful report is to be prepared.

17. People do not know what data is available or how it can be accessed.

Other difficulties could be noted. But the point here is not to be critical of efforts to create computer information systems to date. Rather, it is that current systems rely on a methodology that is restricted by software and hardware characteristics beyond the control of anyone. In order to satisfactorily develop solutions that do not carry these same problems into new situations, a different order of software utilities must be employed. Also, applications software will have to be designed to make optimal use of all data being captured in a systematic, integrated fashion.

F. Institutional Goals

The construction of an effective and efficient planning and management system is necessarily an institution-specific process. Indeed, the commitment of an institution to the development of a planning and management system is itself a reflection of an institution's goals. Further, this set of systems becomes a part of the uniqueness of the institution. As a planning and management system becomes an organic part of the institution, the methods by which data is used can accentuate the institution's uniquenesses. Thus, it is incumbent on the University of Nevada Reno to identify its goals for the future so that computer systems will form an integral part of the University's future. The general goals the University wishes to see advanced by an integrated planning and management system are:

1. To continue to provide the highest possible quality of education to the citizens of Nevada by attracting and retaining superior faculty, by making judicious use of such university resources as faculty, facilities and students and by providing highly supportive student, library and other services.

2. To advance human knowledge through research and public service programs that address the needs of the State and nation.

3. To provide an institutional environment which is responsive to continued growth in the number of students served, to increases in funded research and to expanded public service programs.

4. To foster the development of institutional capacities for the accurate evaluation of institutional processes, programs and goals, and for responding aggressively and flexibly to innovative demands and pressures.

5. To identify information as a University resource which can improve the total managerial capabilities of the institution through techniques for better self-assessment, through institutionwide coordination and prioritizing, through the identification and evaluation of alternative futures.

6. To respond objectively, quickly and clearly to requests for information and to demands for accountability. With the confidence that all of the resources received have been utilized wisely.

G. Institutional Planning and Management System Priorities

Four major subsystems within the data base have been identified. In order of the University of Nevada Reno's priorities, the desired order of implementation is:

1. Personnel, Payroll and Position Control,
2. Financial with financial aid and student billing,
3. Student and Academic Information,
4. Facilities/Real Property/Equipment Inventory.

II. COMMON SYSTEM NEEDS

II. COMMON SYSTEM NEEDS

A. Overview

The University sees the need to establish an integrated and total administrative software support system for all major planning, management and operational functions. For the purpose of this report on University requirements, four major applications areas have been identified by the UNS Management Systems Committee: Finance and Budgeting; Student and Academic Information; Personnel and Payroll; and Facilities. Each area has been defined by an overview, data entry requirements, processing/system requirements and reporting requirements. These three types of requirements are further defined as either being mandatory or desirable, with occasional references being included as to features which are specifically not requested.

The requirements listed in this section II are those requirements essential to all of the four areas and will not be restated for each of the sub-areas.

B. Data Entry Requirements

The applications software must provide:

1. Complete on-line access and data base maintenance.

2. Security features which restrict data access and maintenance by account, program, file, record and data element, as necessary.

3. On-line data entry which can be easily performed by typical office or administrative personnel. Entry should, as much as possible, replace manual operations currently employed and ought not to impose greater labor costs.

4. Editing and validation routines as part of all data entry and maintenance procedures.

5. For the elimination of paper, where possible, in the user offices.

6. For a forms generator capability which can be used by University staff to develop new data entry applications.

7. For controlled data access by user password and terminal address available at all locations.

8. Data base update including the ability to utilize optical scanner input.

9. For data entry for most files via batch and on-line modes.

10. Whenever possible, data entry and data maintenance procedures using easily understood user prompts, menus, well-designed data entry screens and easily understood error messages.

11. Audit trails and logs of all data entry/update transactions.

12. Each major administrative officer with access to a terminal of an appropriate technology sufficient to have on-line access to data and programming power necessary for that officer to fulfill his or her responsibilities.

13. As much as possible, for point of transaction data entry with unique ID card identifiers, optical character readers, turn-around documents and other machine readable forms.

14. Students, faculty and staff should have machine readable ID cards (barcode, magnetic tape or raised letters) that

are utilized regularly to call up appropriate records and to verify identification.

15. DECmate I's and II's should be able to communicate with the mainframe to utilize the data base for obtaining mailing lists and labels, receiving printouts, acting as a dumb terminal and for interchanging files. As much as possible, other standard ASCII terminals should also be able to communicate with the mainframe and the data base.

16. Consideration should be given to providing a microfilm storage facility for the storage and retrieval of records such as transcripts, letters of recommendation, etc. that originate outside of the University.

C. Processing/System Requirements

The proposed software system must:

1. Be flexible and designed for ease of maintenance.

2. Be based on a modern data dictionary and relational data base technology to meet the needs of multiple users with complex data needs and to provide for integrated systems.

3. Ensure quickly and fully recoverable data bases following any type of system malfunction or failure.

4. Permit data elements to be easily added or changed with minimal affect on application programs.

5. Accommodate local processors, especially DECmates and Burroughs B-20 microprocessors, that provide data and/or word processing and integrate these devices with the central information system by assuring compatibility.

6. Provide user friendly software packages, high level command languages and interactive program development at the user CRT without the need for professional programmers.

7. Provide appropriate controls for each system and subsystem.

8. Provide office automation services to supplement the overall management information system. This would include executive calendar searching and scheduling, telephone directories, text processing, optical character readers, spelling dictionaries, electronic mail and other aids.

9. Provide audit trails which can be used for financial auditability, problem investigation and recovery, and security/privacy concern.

10. Provide an effective interface to user friendly statistical, spreadsheet accounting and forecasting, graphics and other decision support packages. A planning and forecasting utility such as IFIPS or EDUCOM's Financial Planning Model (EFPM) should be recommended as a natural complement to the mainframe and the data base.

11. The system must permit easy access by authorized users to on-line information.

12. The major data base functional areas must interface with one another.

13. The system must monitor all report requests and log unauthorized requests for information access or reports.

14. Data elements should be defined to provide compatibility with Higher Education General Institutional Survey (HEGIS) reporting, the Higher Education Facilities Inventory Manual, the National Center for Higher Education Management Systems (NCHEMS) Data Dictionary, National Association of College and University Business Officers guidelines, and Federal standards (such as A-21).

15. The system should easily accommodate changes in operational policies regarding such elements as fee structures, salary withholding disbursements and financial aid procedures.

16. Include controls which:

    a. Provide an audit trail so that all transactions entering the system can be identified from source documents to detail historical files.

    b. Ensure the reliability, accuracy and non-duplication of data entered, maintained and reported in the system.

    c. Control access to the data base through appropriate security measures for data inquiry and update. As much as is feasible and within specific assigned authorizations, the system must provide the capability to add, delete, correct or modify any or all records or parts thereof.

    d. Provide the capability to select, aggregate, summarize and consolidate data in conformance with user operational requirements.

17. The system should permit easy alteration in major programmatic operating processes without jeopardizing the data structure in place.

18. The inclusion of superior user manuals and training media to encourage optimum usage of the system is essential.

19. The system should permit individual colleges to develop unique data bases within the overall structure so that this data can be correlated with institutionwide data.

D. Reporting Requirements

1. Lengthy hard copy reports must be avoided by providing exception reports and extensive on-line data inquiry features through CRT devices, whenever possible.

2. Paper forms must be eliminated whenever possible by providing direct inquiry capabilities to the user department.

3. Users must be able to request off-line batch reports through their terminals and direct output to local or central printers.

4. Local hard copy must be supported through low and/or high speed printers and/or graphic plotters at the option of the user.

5. User friendly, high level command language, inquiry language and report generator must be available to provide administrators with appropriate decision making and ad hoc reporting capabilities.

6. The system should provide operating, management and planning reports of a wide variety.

7. Information requests should be permitted to address various levels of aggregation.

8. HEGIS and many other institutional studies should be generated without recourse to interoffice correspondence and data reconciliation.

9. Exception reports as well as comprehensive summaries must be available.

10. All reports not available in real time need to be printed in short time periods following the close of a reporting period.

III. GENERAL ADMINISTRATIVE SUPPORT

III. GENERAL ADMINISTRATIVE SUPPORT

Much of the report which follows describes specific data entry, report and processing requirements for each major sub-area. While collecting information about these areas, it became obvious that some general capabilities were desirable to support decision making that are less oriented to transactional data than they are to institutional qualitative and policy data. Internal studies through the Office of Planning, Budget and Analysis, dean's offices and other administrative units have a substantial interest in having ready access to data and modeling/analysis packages that provide direct, quick access to information. Among the needs identified were the following:

A. Word processing equipment and optical character readers should be used for the storage of course syllabuses, administrative manuals, graduate school policies, faculty vitae, committee reports and policies and other narrative documents. These files should be readily accessible on-line for review whenever necessary. Keyword searches and listing of department-specific data are needed.

B. Departments and colleges frequently engage in self-study and program review. Much of the data involved is cyclically required in repetitive formats. Reports are needed that assemble for a department, information on faculty quality, load and productivity, facilities, curriculum, tenure and promotion reviews, actions on prior review recommendations, student grade, graduation and progress data, library, computer and other instructional resources, alumni success data and advisement services.

C. Many departments and offices will have data handling requirements that are unique to their operations. A sophisticated set of decision support services providing a data base manager, a graphics presentation system, and modeling languages are essential. If at all possible, these services ought to be able to access existing files for accurate, current data, and not be forced to rely on estimates or non-current data.

D. Throughout the University there are offices which are "exceptions" to the general procedures in effect elsewhere. The School of Medicine, for instance, has a higher degree of confidentiality placed on its student data. This School also has its own finance, personnel and admissions staff. In instances such as this the offices involved should be able to interface with the overall system while retaining the most appropriate organizational processes for a given task and set of policies.

E. Comparative cost, staffing and other institutional data from other "peer" institutions selected nationally or from within the Big Sky Conference would be useful. The system should facilitate the assemblage of such data.

IV. STUDENT AND ACADEMIC INFORMATION SYSTEM

IV. STUDENT AND A ADEMIC INFORMATION SYSTEM

A. Overview

The primary focus for :he student information system is academic-related informat ion. The student system must, however, accommodate other s udent related data (e.g., financial, medical, housing, biograp ic and demographic) as required by a variety of University c fices to perform a broad range of student-related functions . Access to all student information must be available on-line as limited by policy and legal constraint to appropriate dministrative offices. The system must have a full range o on-line inquiry/update capabilities and a complete set of st ndard reports. Reporting capabilities must also include th e ability to initiate ad hoc reports on line. The system mu t provide the facility to prevent unauthorized access or up lates to the student data base. The data base must be readily expandable so that new data elements can be added with little r no program modification.

The system must be capal le of accommodating current enrollments of around 9,500 st dents per semester (headcount) and 6,000 students in the sum ner session. The headcount estimate includes part-time, cont: nuing education students. Approximately 65% of the student are full-time.

B. Academic Records and Registration

The academic records system must support the traditional student record keeping functions including preregistration, student scheduling, registration, drop/add activity, transcript maintenance and production, classroom assignment and scheduling, space assignments for special events, grade reporting, degree audit capabilities for graduate students (and as feasible for undergraduate students), and course planning and scheduling.

The data base should include important data on admissions, current and future student registration, (not past registrations), performance, academic, disciplinary and financial holds, and provide for storage of "college specific" or "department specific" information. Further, the data base must provide for information related to University course offerings and programs. It should include an inventory of courses, graduate degree requirement indicators, listings of approved major and minor programs, term class schedules, current and past instructors, classroom assignment data, and historic course registration information.

Both student and curriculum information must be completely relatable. The system should provide for an archival procedure where only the most recent information and certain planning data is on line. Historic data must be accessible for analyses and reporting.

1. Data Entry Requirements

Batch update techniques should be used to handle volume input such as grade reporting and mass registrations. Critical data entry requirements are identified in the following sections.

a. Student academic records must interface with and, when appropriate, be initially created from the admissions system.

b. To ensure current information in the academic record it is important to have flexible update procedures, both on-line and batch.

c. Daily log listings should be produced to record all update transactions that have been entered from each terminal.

d. A student ID card (with a bar code, raised letters or magnetic strip) should be used for some types of data entry/identification when appropriate.

2. Processing/System Requirements

The student academic record system must be responsive to a wide variety of users from various academic and administrative offices throughout the University. The two main requirements of the system for this responsiveness are (1) controlled on-line access to the data and (2) quick turn-around ad hoc reporting. Specific requirements are identified in the following sections.

Mandatory:

a. The data base must interface with the facilities file and provide a description of all classrooms available for scheduling.

   The University Registrar must interact on-line with the classroom portion of this data base to maintain data on classroom characteristics for instructional purposes. Data items include room type, seating capacity, blackboard space, air conditioning, campus location code, etc. Departments' classroom requests must be posted against this classroom file for room assignment planning. Classroom characteristics must be adequate to prescribe which courses can meet in that room. Classroom assignment criteria must be easily modified. The system must have the capability for on-line interaction to make individual room assignments based on current utilization displays. These special room assignments will then automatically generate notifications (via terminals) when appropriate to designated offices for room-use activities (unlocking, heating, cleaning, security, etc.)

b. Inactive, present and future course information must be part of the data base.

c. Timely publication of a schedule of classes for registration purposes is required.

d. For pre-registration purposes, the existing CARS registration algorithm must be integrated into the system. Batch input during preregistration should phase into on-line input through the drop/add period.

e. To minimize arena registration activities the system must effectively process mail registrations and individual on-line registrations. A check should be made for proper student advisement.

   The system must handle both batch and on-line registrations and include resident and non-resident credit as well as non-credit registrations.

f. Drop/add must be completed on-line at terminals at designated locations.

g. Accurate, efficient and timely auditable grade reporting with provision for changes must be part of the system.

h. Academic Record Updates.

i. Change of Address: The system must accommodate at least two addresses for each student including permanent home and local mailing addresses.

j. Change of Name: Previous names must be maintained in the record.

k. Changes to Academic Program: All program majors (options, minor, etc.) in which a student was enrolled must be maintained in the system and be available for on-line review and reporting purposes. The system must also maintain data on multiple majors and multiple degrees.

l. Satisfactory-Unsatisfactory Indicators.

m. Graduation Indicator.

n. Advanced Standing (transfer) Student Summary.

o. Withdrawal.

p. Academic Drop and Reinstatement Information.

q. Hold Indicators: Types of holds include financial, academic and disciplinary. Each term students are not permitted to register due to holds placed by some University office. The system must provide the capability of having holds placed and removed via on-line terminals by the office responsible for that hold. The system should automatically produce letters of notification to the student for each hold. In the case of financial holds such as library, traffic fines or unpaid debts, the next term's bill should include a complete list of amounts due. This is an important requirement to reduce the arena registration activities.

r. Identification of delivery system for all courses offered.

s. Appropriate data elements for identifying international student status.

t. Verification of enrollment notifications: The system must automatically produce verification of enrollment forms and/or enrollments for specific student requests.

u. Degree audit/graduation capability for graduate students and, as feasible, for undergraduate students.

The system must provide the capability to compare a student's academic course history against program degree requirements and against program essential course requirements to determine progress towards degree completion. Degree audit reports should be requested and reviewed via on-line CRT terminals located within the colleges. Hard copy degree audit reports should be produced on the local printer. The audit capabilities should include the results when a change of major is used in anticipation of an actual major change to determine eligibility for entrance to that major. Also, colleges should have the opportunity to add special audit features to assist advising (e.g., tracking grades in key courses, generating lists of students not meeting certain requirements). Printed results of these audits should be available for academic advising. Graduation reports should automatically be generated by the system at terminals within each college. College decisions regarding graduation eligibility should be entered directly into the system via their terminal. After a specified time, the eligibility indicator would be used for graduation program printing and diploma ordering.

The pre-audit should include consideration of:
(1) University requirements,
(2) College requirements,
(3) Department/major requirements,
(4) Minor requirements.

v. The system must use a coding structure that easily permits the addition of new academic programs or the making of changes to existing programs.

w. The system must utilize a flexible routine for calculating student semester and accumulative averages.

x. The student system must interface with other University systems including the Financial, the Personnel, Payroll and Position System and the Budget System.

y. An on-line index of available screens must be provided.

The index should identify available screens organized by type (financial, academic, etc.) and what offices have inquiry only and update privileges.

z. The system must interface with word processing equipment to prepare correspondence to students regarding graduation and drop status.

aa. The system should allow for course scheduling requests to be entered on-line. This facility should allow for innovative or flexible course schedules to accommodate Continuing Education programs.

bb. Course scheduling and assignment algorithms should give early and periodic notice of courses required to meet student demand.

cc. Departments should be able to access student academic data on-line, eliminating the need to retain duplicate paper files.

dd. Several colleges and schools have competency and proficiency skills requirements. Procedures and reports for maintaining records on the progress of students through these modules of instruction are essential.

ee. Students should not be enrolled in a course for which there is a pre- or co-requisite. A student may be authorized to enroll by exception with the approval of an adviser and with a logging of the approval.

ff. Student records should distinguish between Federal and non-Federal students, affirmative action categories and family income.

Desirable:

a. Leave of Absence: Leave of absence information must include the effective date of leave and estimated return date.

b. Request for transcripts and dates sent.

c. Identification for students who are handicapped, resident hall advisors/counselors, varsity athletic, ROTC, veteran, foreign status, sex and ethnic status.

d. Individual student records should identify program options, minors, simultaneous degrees, sequential degree programs, multiple major programs, enrollment elsewhere in the University of Nevada System and indicators for other special programs.

e. The system should provide a data base capability with necessary interactive software for departments and colleges to perform course offer planning, course offer scheduling and course offer registration activities.

   This feature should include on-line interaction to add/modify these data to support departmental curriculum planning. Information should be provided by department, college and campus on course inventories, program inventories and program essential course inventories.

f. The system should have an interactive feature to request information from a department office or to verify certain data with the student to automatically monitor the status of missing or incomplete information in student records.

g. Summer school scheduling procedures should prevent the overlapping in time of selected courses.

h. The system should be capable of automatically closing courses and course sections which do not obtain a sufficient enrollment. The cut-off would vary by course.

3. Reporting Requirements

Numerous reports must be available from the system to support the users and activities noted under the section Processing/System Features. Two primary modes of output of the system will be (1) terminal inquiry and (2) standard and ad hoc reporting. In addition, the data base should accommodate the use of statistical packages such as SAS and SPSS so that research and analyses can take place utilizing the various analytical tools provided by these statistical programs.

Mandatory:

a. Comprehensive enrollment reports that reflect the organizational and academic structure of UNR, including HEGIS reports.

b. Graduation and degrees granted reports.

c. Reports on withdrawal and drop activity.

d. Grade distribution reports.

e. Pre-registration reports including student course demand and course offering capacities.

f. Honor roll, probation, suspension and disqualification.

g. Published schedule of classes.

h. Class list and class list summaries available day-by-day.

i. Reports on program essential courses.

j. Reports on course offer planning and course offer scheduling by department, college and campus.

k. Faculty instructional reports.

l. Labels for special mailings.

m. Special list of a specified group of students.

n. Student performance reports by program, department and/or college.

o. List of students not meeting academic requirements.

p. Missing information reports.

q. A report is needed for the Assistant Dean of Students responsible for fraternity and sorority affairs, that identifies individual scholarly attainments, pledge attainments and summaries. A similar report by dormitory is needed by the Housing Office.

r. Two telephone directories of faculty and staff and of students must be published using appropriate files in a timely fashion. The directories should not print information regarding persons who choose not to be listed.

s. Department chairpersons should be able to generate reports on the number of majors and nonmajors currently enrolled. Also historical data on the number of graduates and majors should be available. Aggregate reports of this type should be available to other administrators.

t. Department chairpersons should be able to generate enrollment statistics by course, by faculty member and by department. Aggregate reports of this type should be available to other administrators. Comparative reports with data from prior year(s) is also needed.

u. A report on the number of students by originating high school in remedial and developmental English and mathematics courses is required by legislation.

v. Early and periodic reports on courses and sections required beyond those scheduled are needed from preregistration data.

w. Advisers and department chairpersons should be able to access on-line a student's transcript (without grades) financial aid information and ACT/SAT scores for academic review and counseling.

x. Colleges should be able to list students by the majors and the minors taken by their students in other departments.

y. Colleges and departments need access to data on student entry to programs, transcipt data and progress to satisfaction of graduation requirements.

z. A report noting, by faculty member, the courses and the course enrollments of that faculty member is required.

aa. Departments should have access to the graduate student tracking data including applicant's prior school, GPA, nationality and financial aid.

bb. Departments should have access to reports of their majors by name, sex, ethnicity, state and county of origin, resident status, year in college and GPA.

Desirable:

a. Academic reports on student retention, tracking and progression.

b. Change of major and degree reports.

c. Degree audit reports.

d. Instructional cost reports.

e. Reports to study peak periods of drop/add activity by location and by course. Analytical reports to study trends in change of major, transfer patterns, length of time to graduate, enrollment predictions for curriculum planning, etc.

f. Information reports on international students to support the Office of International Student Affairs.

One such report should be a directory of important data on international students that is produced each semester. Another report should moniter the minimum credit load required to maintain "student" visa status. Another should identify those that have outstanding financial obligations.

g. A display indicating whether a student has had a hold placed on their record, what the hold is, or whether a student has a prior history of passing checks to the University for which there have not been sufficient funds to cover the amount paid.

h. A report and record keeping system on registrations for one-day summer orientation sessions is desirable.

i. A summary of course productivity by instructor is desired at the end of each semester with an indication of the number of drops.

j. The data base should facilitate the preparation of reports on student attrition in a time frame sufficient to permit follow-up studies.

k. Enrollment procedures should check to see if a student's course achievements include satisfactory completion of prerequisites and, if necessary, that a student is enrolled in a required co-course.

l. Analyses of trends in student course demands would be useful.

m. A report identifying courses in which undergraduate and graduate students are enrolled and the proportions of each is needed.

n. Comparative grade point averages of students by department, college and institution is desirable. This would include a comparison of student's GPA in their major with their GPA in their other courses.

o. A report analyzing student loads for major courses, present and projected, are desired which aid in future course planning. This report could analyze unmet course requirements of current majors.

p. A report on doctoral dissertations completed that have an effect/no effect on Nevada is desirable. This data should be relatable to similar data on faculty research.

q. Listings of new and returning students assigned to faculty advisors is desirable. This listing should include basic biographical and academic data.

r. The School of Nursing would find it useful to maintain a file of clinical facilities and their characteristics for nurse practicums. This listing would be used to match placements with student needs and interests.

s. Dean's offices need access to student records to identify potential scholarship recipients by major and GPA.

t. Course planning procedures should include a graphic printout of courses in session by hour and room for a given college and department.

C. Student Billing and Accounts Receivable

The Student Billing and Accounts Receivable subsystem must be integrated with the student admissions and academic records, financial aid, and housing assignments subsystems. In addition it should interface with the budget operation and planning, personnel and payroll resources and financial systems.

1. Overview

The primary objective of the student billing and accounts receivable system is to provide for the collection of all student fees based upon educational services received and costs incurred while attending the University. An accurate and timely billing system, including appropriate integration with all major student data files, is necessary to carry out this function. Effective editing facilities must be available to ensure the accuracy of all data. Paper should be minimized from the system, as much as possible, while maintaining appropriate controls and auditibility.

The billing and accounts receivable system must be capable of handling the number and mix of students described in Academic System Section.

The University plans to consider a student billing based on an accounts receivable basis using an estimated bill at the time of preregistration.

2. Data Entry Requirements

Mandatory:

a. Various offices throughout the University must have the capability to directly enter or have access to detailed information.

   These might include but must not be limited to Student Housing, Financial Aid, Police, the Library, the Bookstore, the Health Center and the Athletic Office.

b. Security features must allow certain organizations to have exclusive responsibility for the maintenance of particular data elements and prohibit unauthorized access.

c. Editing and validation of all input data must be performed at the time of entry to assure the integrity of the data base.

d. Each outstanding charge must be entered via on-line or batch procedures with subsequent automatic notification to all affected offices including the office entering the charges and the Controller.

3. Processing/System Requirements

Mandatory:

a. All detailed transactions posted against a student's financial account must be available on line for a period of one year. Transactions older than one year from date of entry must be available for archiving.

b. The system must have appropriate ties to financial aid data, student employment, student loan and scholarship and prizes data.

c. The system must be able to accommodate systematic billing at regular intervals as well as special ad hoc billing when a student's status or characteristics change. Billings to International Agencies are needed. The system must accommodate on-line posting of fee payments.

d. Tuition, room and board charges and estimated bill payments by semester for the current academic year must be available on line.

e. The system must accommodate on-line as well as batch charges and adjustments.

Departments authorized to charge the student general deposit (Housing, Library, Health Center, etc.) must be able to enter charges and adjustments on line. Sufficient details must be provided to easily reconcile the on-line system to the General Ledger.

f. The system must be capable of calculating prorated amounts for refunds or supplemental billings due to status changes.

g. The system must accommodate all charges to the student.

h. The system must be capable of handling all University student financial accounts regardless of the location or mode of education delivery.

i. Externally awarded aid and university assistance of all types must be available in the system.

j. A credit/debit system to transfer financial aid funds to cover deferred fees and expenses is necessary.

4. Reporting Requirements

Mandatory:

The primary output of the computer system is the production of accurate charges to each student itemizing aid and scholarship credits and all fees assessed. On-line access to each student's financial data must provide a detailed account of all transactions for a minimum of one year. Other systems output features include the following:

a. The system must produce periodic reports of all transactions in student accounts.

b. Ad hoc reporting must be available to assist in planning and evaluating operational effectiveness and for public information purposes.

The type of reports must include: number of out-of-state students on campus, number of athletic grants-in-aid, number and value of certain scholarships, number and value of other types of assessed fees such as parking violations, overdue library books, health center visits and dormitory assignments. Other reports include late payments for international sponsored students, number of credits taken by a student in excess of a normal full-time load, income for food and housing by cost center, and number of students not paying estimated bills who have not had an approved due date extension (to assist Housing and Saga Food Services to identify "no shows"). Some reports must list recipients of awards for specific funds for the current academic year.

c. The system must be able to identify and report on students taking courses in both resident instruction and continuing education and automatically flag a student's account in order to prevent the untimely refund of student account balances.

D. Financial Aid and Student Employment System

1. Overview

The Office of Financial Aid processes approximately 9,000 requests from students each year for some type of financial support for their education. Approximately 6,000 students receive aid. Financial need analysis information is received from over 3,000 students each year.

The Scholarships and Prizes Committee manages $1.2 million in annually paid scholarships and endowed scholarships. Approximately 2200 students receive awards that are generally available, restricted to a department, or restricted by the donor.

The Student Financial Aid System should provide an integrated data base with effective on-line data entry capabilities. The system must provide complete individual student financial aid records on line and effectively interact with other data systems including Admissions, Controller's Office, Registrar, Scholarships and Prizes, and Payroll. On-line features must include the capability of the Financial Aid Office to access and modify financial aid information on each student's record. Paper, as much as possible, should be eliminated while maintaining appropriate controls and auditability.

The computer system for student financial aid must support several functions. Major functions include:

a. Monitoring student enrollment and academic progress,

b. Awarding, notifying and tracking students in the College Work Study Program,

c. Monitoring wage earnings of aid recipients,

d. Awarding and adjusting aid,

e. Student budgets (cost of attendance),

f. Managing information on all awards and able to adjust notifications,

g. Tracking all correspondence to and from students,

h. Processing and validation of Pell Grants,

i. Processing Guaranteed Student Loans.

The Office of Financial Aid monitors all college work study and campus employment, long term and short term University loans, federal and state grants, athletic grants, University academic scholarships, assistantships, fellowships, grants-in-aid, and grants and loans from external sources. In addition, a research function is performed to ensure the Office of Financial Aid complies with Title IV requirements and is in accordance with federal and state regulations.

2. Data Entry Requirements

Mandatory:

a. Data entry into the student financial aid file must be permitted in both on-line and batch modes originating from both internal and external sources by only the Financial Aid or Controller's Office.

   Internal sources would include possible transfer of information from other University data files of up-dated information from the student or parent. Data from external sources would be in the form of magnetic tapes from College Scholarship Service and the American College Testing Program. A primary source for data entry would be information from the financial aid application itself.

b. On-line up-date procedures by the Financial Aid or Controller's Office must be available to alter awards, grants and scholarships and student data must include appropriate control/security features to assure privacy and confidentiality of sensitive student or family financial and personal histories.

   Appropriate control reports must be available that summarize the number of transactions, errors, total records, etc. The system must ensure timeliness of all financial aid data entered. Appropriate error messages and editing routines are required to ensure an accurate data base.

c. Awards not processed by the Office of Financial Aid, such as scholarships, must be entered into the student's financial aid record only by the Financial Aid or Controller's offices through up-date procedures. Those offices responsible for their approval must coordinate their awards with those of the Financial Aid Office through the software.

d. The system must provide the security needed to prevent modifications by any one, or by any office other than the Financial Aid Office, to need analysis and adjustment of aid once these have been established.

   Some records should remain in the file but be excluded from all processing including up-dates (e.g., in case of death).

e. The on-line up-date capability must allow automatic validation of selected Pell grant and campus based aid applications as a result of obtaining additional data from applicant interviews and follow-up sessions.

This on-line interaction should permit adjustment of parameters to simulate conditions of student eligibility. Once conditions for eligibility are established and an aid decision is reached, modification to the student's record should automatically generate an award letter.

3. Processing/System Requirements

The Office of Financial Aid user requirements and expectations must address specific needs for the Student Financial Aid System to perform interactively with other systems. These other systems include: Billing and Accounts Receivable, Scholarship and Prizes, Academic Records, Admissions, Housing and Payroll. In addition the student financial aid system must accommodate information concerning federal allocation and student loan repayments, student academic progress, admissions advanced standing status, wage payroll and work study earnings, part-time status and degree status to help support the Office of Financial Aid requirement to monitor the student's aid eligibility status.

a. The student aid record must contain several specific data items for overall analysis/decision and monitoring by the Office of Financial Aid. These include:

(1) A history of all aid including amount, source and year.

(2) Annual student financial aid budgets to identify cost of attendance.

Data items required would include state of residence, housing status, enrollment status, credit load, unusual costs of attendance and varying commuter transportation costs.

(3) Short-term loan information.

(4) Financial Aid Transcripts production and monitoring.

(5) Academic, biographic and demographic data.

(6) Supervisor job description information.

Job description information should be automatically up-dated.

(7) All correspondence (sent and received) by date.

(8) Validation indicators from federal/state tax form(s) and other related financial records.

b. The system must have the capability to record both type and date of all "official" correspondence in the student's record and to generate notification records via word processing equipments.

These notifications would be for awards, adjustments, overawards and other correspondence.

c. State, federal and institutional academic program requirements must be monitored to ensure requirements are being met for satisfactory progress.

   This must be accomplished via on-line (for most cases) or through a selected reporting capability (for several cases). The system must automatically calculate the student's budget by type of housing, veteran and dependency status to determine aid eligibility.

d. The on-line system must interface with both the Scholarships and Prizes and the Controller's Office and produce reports so that each affected office can utilize the system to monitor their own programmatic responsibilities.

e. The system must include a capability to process campus-based awards to late applicants by group and rank order.

f. The system must provide a means to track aid sources awarded to students by agencies, foundations, corporations and private interests outside the University through implementation of the agency account system.

   The information must be up-dated by the Controller's Office to ensure that a complete accounting of these aid sources is noted in the student's record. The on-line system must provide prompt and current access to these data and have the ability to utilize these data in determining eligibility for other university-administered aid.

g. Student financial aid must be compatible with and relatable to other student information.

h. To comply with federal requirements the system must be able to monitor and identify all students who are "overawarded" before final approvals by the Financial Aid Office are implemented and disbursed.

i. The Scholarships and Prizes Office must coordinate their award processes with the Financial Aid Office.

j. Guaranteed Student Loan (for both students and parents) recommendations should automatically be processed with appropriate letters being sent to students (or parents) and enrollment verification sent to lenders and guarantee agencies.

The processing system must determine all required elements for transfer to the loan application.

k. Approval of a work study assignment should encumber 20% of anticipated salary in an appropriate department budget (not 100%).

l. Checks or credits to a student's account related to a scholarship and prizes award should not be made until a check has been received from the donor.

m. Scholarships which are spread over two semesters should not be credited to a student's account or a check issued if the student's GPA is less than that required, or the number of credits earned in the first semester is less than that required (12 cr.).

4. Reporting Requirements

a. Yearly fiscal operations report and application for federal funds must be provided.

b. A periodic report must be generated to track University wage earnings of federal aid recipients.

c. An end-of-year summary report on work study students is required.

d. Reports of a statistical and research nature should be available to monitor the Office of Financial Aid procedures to produce internal audits required by both federal and state agencies and to determine compliance with Title IV.

e. A summary report for EOP awards is required.

The report should contain variables describing Educational Opportunity Program and academic eligibility, duration of award and other pertinent information.

f. A report must be available to link tuition grant-in-aid benefits with employee.

g. Summary reports identifying total aid by source are required each semester.

h. Reports should be developed to monitor the entire financial aid award process and validate award decisions based on state and federal requirements.

i. Access to on-line screens must be secure and must display all data elements needed for evaluation and decision regarding financial aid by the Financial Aid Office.

j. The system should produce secure on-line screens accessible by the Financial Aid and Controller's offices.

k. On-going fund management must be supported by the capability to produce periodic reports on current fund balances.

l. A report on college work study earnings per pay period (2 per month) by individual and summary for the institution, cumulative year to date remaining allotment and hours remaining, in addition to fiscal and calendar years are needed.

m. A monthly record of earnings of regular student employees, in addition to summaries of fiscal and calendar years are needed.

n. The offices of Financial Aid, Scholarship and Prizes, and Student Placement need access to files indicating a student's admissions status, GPA and enrollment for verification of eligibility.

o. Composite report of student aid package assignments are essential. These should include information about all of each student's financial aid scholarship and prize awards, athletic scholarships and part-time employment.

p. It would be desirable at a future date to have the capability of having financial aid packages computer-generated.

q. On-line information regarding unassigned scholarships should be available to individual departments via keyword searches to assist their majors in financial need.

r. A report should summarize the awarding of Bureau of Indian Affairs funds.

s. The Office of Special Services requires a report based on federal requirements noting the total number of students in the program, and distinguishing within that group the numbers and proportion of:

(1) male vs. female,
(2) first-generation college attendees,
(3) low income participants,
(4) physicall-disabled students,
(5) ethnic origin groups,
(6) veterans.

t. It should also include reference to each student's involvement in project activities such as:

(1) student orientation,
(2) individual counseling,
(3) group counseling,
(4) college reentrance,
(5) tutoring,
(6) basic skills instruction,
(7) cultural enrichment activities,
(8) referrals to health,
(9) employment,
(10) housing,
(11) legal agencies and resources.

u. Students who are separated from the program should be identifiable as:

(1) project services no longer required,
(2) transferred to another university or college,
(3) graduated,
(4) insufficient financial aid,
(5) entered armed forces,
(6) personal reasons,
(7) health,
(8) death,
(9) academic dismissal,
(10) administrative dismissal,
(11) continued participation unprofitable,
(12) total (a summary figure of all reasons).

v. The Scholarships and Prizes Committee requires reports identified in its annual report. These include:

(1) listings of agency accounts,
(2) listings of endowed accounts,
(3) summaries of (1) and (2),
(4) scholarships available per capita,
(5) scholarships by sex, class level and college/division,
(6) proportion of scholarships by college/division, and
(7) historical summary.

E. Graduate School

1. Overview

The Graduate School is responsible for the coordination of the individual departments offering approved advanced degree programs and the systematic review of graduate students' progress toward the completion of degree requirements. Approximately 1,000 graduate degree students are registered each semester with 200+ masters level and about 25 doctoral level graduating each year. An additional 1,000 students not registered in degree programs are taking graduate courses.

The Graduate School operates a centralized college-level system of record keeping and program control. The Graduate School is responsible for verifying and coordinating the recording of the results of various degree requirements (on forms GS-1 through GS-9) and reporting them to the registrar for each applicant for graduation. It is important that this record keeping function be timely and accurate. Other areas of responsibility which must be addressed by the data bases maintained by the computer system include: graduate academic program review, minority recruitment, and University student support, monitoring thesis standards, coordinating membership records of graduate faculty and coordinating graduate intercollege programs.

2. Data Entry Requirements

Mandatory:

The primary mode for entering data must utilize on-line CRT terminals with comprehensive computer editing procedures. Data to be entered would include all information required in forms GS-1 through GS-9. These forms record information about the approved program of study, candidacy and comprehensive examination, the foreign language requirement, the final oral exam and the thesis. The tracking system should provide ready identification of a student's individual progress, as well as summary and comprehensive data on students at different phases.

The data base should accommodate entry of masters and doctoral committee member names and department affiliation.

3. Processing/System Requirements

Mandatory:

a. The graduate student record including biographic information must be available for each student from application through graduation and have archival retrieval capability.

b. A graduate faculty data file for 450 faculty is needed to support the continued appointment of faculty to this body. The record would include research underway and completed, number of graduate committees served on, and number of graduate courses taught.

c. Graduate students registered in a program who fail to register in subsequent semesters should be recorded and reported. A student who fails to register during a two (2) year period would be placed on an inactive list.

d. The system must provide automatic notification to students as critical Graduate School decisions are completed.

   This notification process should utilize word processing equipment that interfaces with the computer system.

e. Graduate school must have on-line up-date capability of any data item for which they are responsible (e.g., graduate faculty data on the personnel system).

f. The data base must support the generation of various statistical reports of all student related information. These may be regular periodic reports or ad hoc reports.

g. Data on graduate students should be available on-line for each department and college.

4. Reporting Requirements

On-line data entry must provide the capability to review on a CRT screen any data element in the data base. Particular screens would include biographic, admissions academic data and data describing academic performace within the graduate program of study as defined by forms GS 1-9. New inquiry screens must be created when needed and standard periodic reports and ad hoc reporting must be part of the system. Specific reports are identified in the following section.

Mandatory:

a. The Graduate School should be advised of all inquiries so follow-ups can be initiated.

b. Statistical reports by college and major must be produced each semester and year regarding admissions, registered students and nonreturning students in the Graduate School.

c. A related report should identify students who were registered in the prior semester but did not re-register.

d. A report to monitor degree progress of graduate students is required which would identify those students approaching special program time limitations.

   This report should be organized by degree, college and academic program. Data would include checks on such things as membership on a student's graduate committee, that the approved courses are being taken, that time limits are not exceeded, and students with Veterans Administration loans are carrying a full load.

e. A report must be available to identify financial aid by college and department.

f. A report is required to analyze the GRE scores for teaching and research assistants and recipients of Regents' awards.

g. A report must be available by college and academic department regarding retention statistics.

h. An annual comprehensive statistical report is required for program review.

i. A report must be available to identify students whose grade point averages are below a 3.0.

j. All reports must have the capability to deal with dual title degrees, concurrent degrees, and inter-college and interdisciplinary degree programs.

k. Ad hoc reporting must be available to provide data to support decision making relating to all graduate students from admissions through to graduation.

l. A course load report by student for teaching and research assistants is essential. A listing of all teaching and research assistants should be sent to the Graduate Office, the Personnel Office and the Vice President for Academic Affairs.

m. Statistical reports should aid the University's evaluation of its progress toward meeting its affirmative action goals. This would include information on all students as well as specifically on Graduate Assistants.

n. Periodic, comprehensive program reviews are made of each graduate program undertaken. The system should assist in assembling information for the departments involved.

o. A report assessing GRE score trends over five (5) years by college, by program and in summary is needed.

p. A follow-up report on provisionally-admitted students who have earned nine (9) credits is required.

q. Registration and graduation reports should reflect biographic data and statistical data on registrants by program, by department, by college and in total on both the "A" and "B" plans.

r. Reports indicating how long students take to complete degrees in different disciplines is required.

s. Reports on the proportion of graduates to non-graduates is needed.

t. Graduated student records should include reference to their employment after graduation to support accreditation reviews.

u. Approvals of a graduate student's completion of all requirements must be provided for the college, department and Graduate Dean.

v. Trend data on graduate students and graduate assistantships by department for five to ten years is needed.

Desirable:

a. A report comparing the number of graduate assistants to the number of graduate and undergraduate students by college is desirable.

b. A statistical biographical summary report by college and program of all registered graduate students is desirable. This might include name, sex, ethnicity, state and county or origin, resident status, GPA, school of origin, sub-area of concentration, advisor, marital status and financial support.

c. The system should produce a graduate student registration statistical report by college and major program.

F. Housing Assignment System

1. Overview

The University of Nevada Reno provides residence hall housing with 1,250 beds. There are over 2,000 applications for housing assignments each year for the five residence halls. The purpose of the Housing Assignment System is to assist Housing in the management of individual undergraduate and married student (40 units with 80 applications) housing with related dining hall services, and to facilitate the issuance of meal authorizations and fee collections for Saga Food Services under four plans. The system must provide on-line data access and maintenance capabilities that will minimize the need for paper handling and manual procedures.

2. Processing/System Requirements

Mandatory:

a. On-line features must support the room assignment process which uses ten criteria for matching roommates. This might include student record checks for security. Changes in room assignments and the release of students from contracts must be possible.

b. The system must interface with the student billing system to provide automatic billing. A flag on students' check cashing capabilities should be available to avoid the cashing of checks by the University for unreliable students and to prevent errors in room assignment.

c. A capability to prorate room and board charges is required.

d. Damage charges must be entered on-line.

e. The system must provide the capability to support short-term assignments for summer conferences.

   This support would include telephone charges for short-term assignments and would be similar to typical hotel operations.

f. Priority assignment for the handicapped and other medically impaired persons must be available.

g. The system must accommodate adjustments to room assignments for change of campus and readmitted students.

h. The status of any student housing assignment must be available on-line at any time in the process.

i. All student addresses (on and off campus) must be accessible and maintained by the appropriate office.

j. A hold on unpaid damage assessments should be included in the student record.

k. Student records should display the students' status (probation, no re-entry, etc.).

l. Student records must display the students' financial awards and scholarship package for allowing deferral of payments and for initiating automatic transfer funds upon grant receipt.

m. A lottery selection procedure should be available for assigning single residence hall rooms.

3. Reporting Requirements

Mandatory:

a. On-line query features must be provided to reduce the need for lengthy hard copy reports as much as possible.

b. Standard reports should be available on a demand basis through on-line requests. These include:

(1) occupancy reports,
(2) meal tickets,
(3) room rosters,
(4) telephone number list,
(5) applicant/contract status report for current and previous years,
(6) listings of students who wish to have their directory information made public.

c. The system should produce address labels for special mailings. These labels would be permanent address, as well as local address mailings.

d. A room-by-room inventory containing such data as the furniture available, wall color, carpet color, drapery color and date of last painting should be kept.

e. The Housing Office should be able to verify admittance of students in order to mail housing forms.

f. Alphabetical lists and mailing labels for dormitory residents should be available by hall and in total.

Desirable:

a. The system should provide a prioritized listing of applicants for married student housing based on date of application. This listing should include a reduction of priority of an applicant and/or notice of non-renewal of a contract when a member of the family unit obtains a graduate degree.

b. An automatic notification should be issued to Housing within 48 hours of a student's official withdrawal.

c. A listing of off-campus seniors living within walking distance would be useful.

d. A listing of "preferred renters" could be maintained to reenforce student reliability, credit worthiness, etc.

e. Housing should be notified of a student's cancellation of food or housing contracts.

f. A residence hall advisor evaluation record should be kept.

g. An inventory/supplies recording should be available for in and out tracings.

G. Admissions

1. Overview

The Office of Admissions and Records processes approximately 8,000 undergraduate, graduate and international applications per year. Of those who apply, 5,500 reach the paid-accept stage.

The primary objectives of the admissions system are:

a. Maximize the timeliness and quality of information dissemination efforts and of admissions decisions.

b. Manage information to support marketing and recruiting efforts.

c. Provide timely data to students and secondary schools, admissions counselors and other University offices regarding the admissions processes.

Admissions activities are heavily oriented towards data handling. Therefore, another major objective of the system would be to minimize paper handling by capturing data from the application and expeditiously entering it into computer storage. The computer-based data would then become the primary source of application information for review and decision. The user should be able to (1) review individual records, (2) up-date individual records (any data item in the record), (3) initiate production of selected reports and (4) initiate mass mailings for offers, missing information, refusals, etc.

Admissions data forms the basis for all student records. It includes biographic, demographic and academic-qualifying data that must be maintained for the student's permanent record.

2. Data Entry Requirements

Data entry must be flexible and may be characterized as (1) TIME independent, (2) DEVICE independent and (3) QUANTITY independent. This system should accept partial or complete application data from the student, the high school or other sources at different points in time. In addition the system should accept data from a variety of devices such as on-line CRTs, portable terminals, other PSU data systems, magnetic tapes and on-line optical mark scanning devices. Some data may be entered directly on-line or via a batch mode from admissions offices at any campus.

a. Reliable data entry procedures (for both initial record creation and subsequent up-dates) must be defined for on-line entry of all data to ensure both accuracy and expeditious entry.

b. The system must permit automatic update of master files with external data, e.g., SAT/ACT tapes.

   This type of data entry is very important for the initial creation of a prospective student data base.

c. Scanning technology must be used to capture data from the original student-completed application.

d. The system should support the acquisition of data on students before they have been admitted.

e. The Office of School Relations requires data entry access to the system in order to track the progress of individual students.

f. Automatic posting of dates within the record for crucial data changes is needed.

g. Ad hoc report requests should be initiated from on-line CRT terminals.

3. Processing/System Requirements

The system must be flexible enough to support the multi-dimensional nature of admissions decisions process.

Mandatory:

a. The system must allow for the development of prediction formulaes -- some for official admissions decision criteria and others for informative purposes.

   These formulaes should be easily modified both in number of formulaes, prediction weights of beta values and number of variables used. Up to 12 prediction formulaes should be actively addressable for different admissions populations.

b. A special data segment must be available in each applicants record for "college specific" data.

   These data may include indicators on special artistic talents for the College of Arts and Science, special work experience or exceptional academic achievements.

c. Initial prospective applicant files must be created from data provided by ACT/SAT. In addition a similar prospective applicant file must be created for all recruiting done by School Relations.

   This file must maintain a record of (1) all responses from UNR to each prospective applicant and (2) all contacts from each prospective applicant to UNR. Prospective applicants must be relatable to actual applicants so that studies of yields based on particular marketing strategies may be undertaken.

d. The admissions data base must be accessible via on-line terminals not only from each counselor's personal desk-top unit but also from college offices and other administrative offices.

   These offices include but are not limited to: Office of School Relations, Veteran's Services, Office of Student Aid, Office of International Student Affairs, Health Services Director, Division of Undergraduate Studies, and Budget and Planning. In addition special access for inquiries and selected modification capability should be available to the Controller's, Housing and Saga Food Services, Office of Financial Aid and Registrar.

e. The system must automatically convert the various high school grading systems to a HSGPA norm for admissions decisions.

The grading system conversion would be based on a set of grading rules that would be defined in the system for each Nevada high school. The identification of each high school would be based on both code and name.

f. The admissions system must include an archive procedure which would purge the file once each year but retain five years of history information.

g. A procedure must be available that would automatically produce reports on applicants who have not been acted upon for a certain period of time.

h. The system should accept application data for any future admissions semester without disrupting the current cycle of admissions processing.

i. There should be a procedure for archiving historic reports on microforms.

j. The system should maintain on-line for review and consideration current and past automatic offer rules and established Admissions policy.

k. An effective enrollment projection on which to base institutional planning is critical. Forecasts by college would be beneficial.

l. Since prospective student records may be duplicated by the ACT/SAT tapes or by different offices, a duplication check should be made before a record is created.

m. All admissions actions should be noted in the applicant's record and identified by type and date.

These should be modifiable by admissions staff for individual applicants or for specific groups of applicants. Along with automatic procedures for mass status changes, admissions staff should initiate results of current specific admissions decisions (offer, pending, etc.) and request the computer system to complete those follow-up activities necessary to carry out that decision (mailing offer letters, request additional information, etc.). This interaction would be handled via a personal desk-top CRT terminal. The system should automatically record within the record the date when the action was initiated and when it was subsequently carried out by the system.

Desirable:

a. The computer logic should include a modifiable, automatic offer procedure.

   This may include "specific" student or "group" offers based on the number of current open slots and the number of qualified students who applied. The system should use the concept of an "offer triple" identifying campus, college (and/or program) and semester for the offer. In addition, the "offer triple" should also distinguish between a dorm and nondorm request. The data base should also preserve information regarding "choice." Student choice is implemented using the concept of "choice triple" which uses the same variables to identify the applicant's choice. The decision protocol for automatic offers should be available for review on-line by admissions staff and modifiable by selected staff when new offer rules are identified.

b. Each record must have a comments section where counselors can record (on-line) pertinent information as follow-up to telephone calls or personal interviews.

4. Reporting Requirements

The reports required for the admissions system must support management and control operations, marketing strategies, and research and analyses. The reports in this section are grouped as to operational, planning and ad hoc.

Mandatory:

Operational reports must include:

a. Weekly status report identifying individual applicants including summary counts by category, location, college, admissions decisions/action and secondary schools.

b. Weekly statistical report comparing last year's activity to this year's activity.

c. Missing information report.

d. Report on current and past decision protocol for making offers.

e. Address labels for inquiries, applicants and approved entrants to be used for special mailings.

f. Semester summary reports similar to "a" above.

g. Annual summaries.

h. Reports on attrition and degree of college success.

i. Reports supporting recruitment should identify and track student inquiries, applications, admissions, disapprovals, registrants and non-registrants by college and major.

j. CRT displays giving status on individual students and allowing modification of tracking information by School Relations.

k. Reports relating yield to marketing and recruiting activities.

l. Follow-up contact mailings to prospective students should be computer-generated.

m. Listings of alumni by zip code would assist School Relations to identify local support persons.

n. Summaries of entrants/applicants by state residence is needed.

Desirable:

a. Analytical reports for prediction formula evaluation and investigation.

b. Analytical reports for referral strategies and measures for admissions counseling evaluation.

c. Reports describing "Who applies to and who attends the University of Nevada Reno" -- background (social economic status, high school, geographic and demographic), academic abilities, educational aspirations, college choice criteria and college success.

An ad hoc reporting capability is required:

These reports would respond to questions of special interest to the admissions processes. This reporting will require special statistical software packages to be run against the data base (such as SAS) to investigate such things as prediction formula modification, automatic offer plan strategies and other new admissions phenomenon that require investigation. The ad hoc reporting function may require access to data as far back as five years. Five years of history in admissions must be maintained for this purpose, however, it would not require on-line storage.

H. Career Planning and Placement

The Career Planning and Placement Office maintains an active list of 1,000 registrants for employment seeking assistance. A list of 15,000 inactive records are also kept.

1. Data Entry Requirements

a. Registrants fill out two placement record forms which should be converted to computer records. This might be accomplished with a registrant directly keying in the data or recording from a machine scannable form.

b. Beyond basic biographic data, the registrant's record should include searchable employment goal descriptors and course information, prior work experience.

2. Processing/System Requirements

a. The basic registrant data file should include areas for tracking the progress of each registrant toward employment.

b. An ability to sort and select records by discipline, career area, key word, major or minor field, and zip code is essential.

c. A file of job vacancies announced should be kept.

3. Reporting Requirements

Mandatory:

a. Individual registrant profiles.

b. Mailing labels and lists as sorted.

c. Periodic listing of employment opportunities.

d. Summary reports tracking student progress and employment level.

e. Departmental offices should have access to the positions upon file.

Desirable:

a. Terminals with access to a data base such as the Guidance Information System (GIS) should be available at this office and in other counseling locations. GIS, for example, contains extensive data in electronic form on general occupations, 4-year, 2-year and graduate schools, state occupations, state occupational/technical schools, financial aids, local businesses, and state services for the handicapped.

b. On-line off-campus searching of registrant file by recruiters via telephone dial-up.

I. UNR Foundation and Alumni Offices

1. Overview

The UNR Foundation has placed their financial records on a microcomputer that adequately serves their needs. However, both the UNR Foundation and the Alumni Office have major data handling requirements with respect to the University's alumni/donor mailing lists. Both offices have a need to utilize all or part of a list of donors, friends and alumni of the University. The latter group includes persons who attended for one semester as a full-time student and is not defined as only those students who graduate.

2. Data Entry

a. Multiple user data entry/modification with lock-out are needed to accommodate what is estimated to be a 10 person-year job to input biographic information about all alumni.

b. Direct system creation of alumni records from graduating/withdrawing student files who markedly facilitate the maintenance of the data base.

c. The same is true of faculty, parent and staff records.

d. Colleges and schools should have read-only access to the information in the files through the UNR Foundation.

3. Processing/System Requirements

a. A report generator, combined with sorting capabilities, must be available for preparing mailing lists and labels.

b. A reporting capability that quantitatively summarizes the numbers of person in the data base with specified characteristics (codes) must be present.

c. Husband-wife-child relationships accommodated by a data base system is desirable.

4. Reporting Requirements

a. Sort and merge letter production production, mailing labels and lists.
b. Summaries of number of persons with stated characteristics.
c. Zip code sorting for mailing labels.
d. Reports on pledge productivity, honor rolls and matching gifts.
e. Donor prospect profile.
f. Annual fund summary.
g. Phonathon pledge forms.
h. Canvasser solicitation summary.
i. Pledge reminder.
j. Report of Board of Regents gifts.
k. Level of gifts by donor category.
l. Level of pledges by donor category.
m. Departmental/college records of gifts and grants from private sources with contact information.

I. Continuing Education

1. Data Entry Requirements

a. Some 20,000 students register through Continuing Education for non-credit short courses, credit classes and correspondence study. Their enrollment forms should be machine readable.

2. Processing/System Requirements

a. As enrollments are entered "flags" should be raised on graduate students who have not graduated from an accredited institution or have exceeded nine (9) graduate hours at UNR without being approved for matriculation in a graduate program. Transcripts should be on file for non-matriculated undergraduates and for students in the Bachelor of General Studies (External Degree) Program.

b. An on-line, short course planning and budgeting system is required which provides, by project, development and tracking. A file of courses in varying stages of development from planned to completed is needed. File records would include information about the course content, course code number, instructors, budget, dates, Continuing Education Coordinator responsible, etc. with all fields subject to modification. This system should have access to a "what if" forecasting facility.

c. Information on short course enrollments and budget items correlated with the course should be available.

d. Files on faculty evaluations with evaluations machine scored must be kept by instructor with allowance for instructor comments.

e. Information on approximately 1000 correspondence course students and their progress through the course is required. Tracking data should include data on tuition paid, receipts sent, books and materials sent, lessons completed by student and returned by instructor, length of time the lesson was with the instructor, issuance of grade, final exam conditions, etc. The system should trigger identification of an instructor and a welcome to the course by the faculty member. It should also trigger follow-ups when a student is approaching the one year time limit for completion without exception.

f. A book ordering and inventory facility is required to support the correspondence course program.

3. Report Requirements

a. Final reports on short courses are required for individual courses and courses in aggregate; by discipline, by credit and no credit and by coordinator.

b. Current short course status tracking reports must be accessible by course code number. Status includes enrollment to date, enrollment to day, income to date and income to day.

c. Student biographical data must be available for market analysis and mailing list development.

d. Reports on equipment budgeted but not ordered or paid for must be prepared monthly.

e. Mailing list preparation is essential.

f. Weekly financial accounting reports, up-to-date and aggregated by object code and by project code are required.

g. The production of standard forms and letters is required.

h. Summer session registration information must be available daily and must include a breakout of the number of credits and income by session.

i. Upon completion of a correspondence course, a grade report completed by the instructor should be reported to Continuing Education and the Registrar.

V. FACILITIES/REAL PROPERTY/EQUIPMENT INVENTORY SYSTEM

V. FACILITIES/REAL PROPERTY/EQUIPMENT INVENTORY SYSTEM

A. Overview

The University of Nevada Reno has a physical plant valued at over $330 million and real property valued at $90 million. The purpose of a Facilities/Real Property/Equipment Inventory System is to provide information for making decisions that will lead to more efficient utilization of existing facilities (i.e., offices, classrooms, laboratories, parking areas, etc.), making decisions concerning facilities maintenance, renovations and additions, inventorying of all University real property and meeting the University's external reporting requirements.

The primary objective of a Facilities/Real Property/Equipment Inventory System is to provide an integrated, shared data base that is accessible to the State Department of Risk Management, the Real Property Boards Office, the Activities and Scheduling Office, Planning and Budget, Controller's Office, Physical Plant, Police Department, Director of University Services, the Chancellor's/Board of Regents offices, The Registrar and the chief administrative offices of University Divisions. At a minimum the data base must contain data on University facilities such as lands, buildings, classrooms, laboratories, offices, etc. and their utilization. In addition it would be desirable to also include data on fixed equipment and facilities other than buildings (e.g., sidewalks, parking lots, cable and utility lines, etc.)

The Facilities/Real Property/Equipment Inventory System must interface with other systems.

B. Processing/System Requirements

Mandatory:

1. The data base must contain data on land with and without improvements, buildings, rooms, real property, parking lots, rental properties and leased properties.

2. Data elements must be defined, classified and coded to provide compatibility with the Higher Education Facilities Inventory Manual.

3. Construction characteristics of buildings must be identified including date of construction, type of construction, type of heat, record of renovations, total area, usable area, total volume, heated volume.

4. Assignable space (rooms) must include data concerning the availability of utilities (air, water, electric voltages, phases, current capacity), lighting type, air condition, blackboard space, seating or student station capacity, type of seating, A-V equipment, etc.

5. Land data must include location, division/college, size, cost, acquisition date, grantee, assessor's number and fair market value.

6. Lease data must include location, rental cost, lease period and landlord.

7. Rental (income) data must include location, rental period, type of property, tenant and division/college ownership.

8. Data must be maintained for land and buildings that are no longer in existence.

9. The system must identify whether facilities are University owned, federally owned, rented, etc.

10. The system must identify rooms by function (e.g., research, instruction or administration). Since a facility may have a combination of functions, the system must allow functions to be identified by percent.

11. Rooms must be identified by type such as office, classroom, laboratory, mechanical, etc.

12. Rooms must be assignable to organizational units by HEGIS code.

13. For University owned buildings, the source of funds must be identified (e.g., state, federal, etc.)

14. The status of each room in a building must be maintained (e.g., idle, under construction, etc.)

15. A means to automatically up-date current land values and replacement values of facilities must be provided.

16. Data concerning the extent to which each facility is or is not accessible to the handicapped must be provided (e.g., indicate which rooms within each facility are accessible to the handicapped).

17. Procedures must be available to maintain historical data for buildings a minimum of 10 years and land indefinitely. (This data does not need to be on-line and be on microform.)

18. The system must provide the capability to add, delete, correct or modify any or all records or parts thereof.

19. Equipment records should be included in the data base that contain data on location (e.g., building and room numbers), descriptive information (e.g., manufacturer, model, serial number), purchase information (e.g., price, vendor), accounting information (e.g., budget and fund number) and identification codes (e.g., electronic would be a major category and oscilloscope would be a sub category). The key to equipment records would be an equipment tag number.

20. Parking administration for students, faculty and staff should include data on parking assignments, sticker number, vehicle data, etc. and be able to handle violation record keeping and billing.

21. Utility consumption data should be maintained in the data base.

    Data should be available by month for a minimum of the past 10 years. The monthly consumption figures should be qualified to indicate whether the consumption was estimated, the building was vacant, etc. The system should handle electric, steam, water, gas, oil and coal consumption.

22. Data for facilities other than buildings should be included in the data base such as roadways, walks, utility lines, intensively maintained landscaped areas, parking areas and outdoor sports facilities.

23. Data concerning the keying of the facilities including the personnel who have been issued keys should be included in the data base.

24. The system should be able to identify special features such as chemical, biological and radioisotope fume hoods, security areas, animal rooms, areas with emergency power systems, etc.

25. The system should be capable of providing a computation of the depreciated value of each building each year.

Desirable:

1. Major building maintenance records should be maintained in the data base.

   Projects completed and projects requested should be included with costs. Requested projects should indicate whether or not they are funded.

2. Building inspection records should be included in the data base.

3. A preventive maintenance scheduling capability should be provided.

   Records of air conditioners, pumps, compressors, fans, heating units, etc. should be maintained. The system should allow the flexibility to assign different preventive maintenance procedures at certain frequencies (e.g., perform procedure A quarterly, procedure B semiannually and procedure C annually). Time estimates for each procedure should be maintained to facilitate assigning the work. The system should require the feedback of all scheduled work to determine whether or not it was completed.

4. Individual colleges should be able to obtain inventories of audio-visual equipment and the locations of this equipment.

C. Reporting Requirements

1. The following reports must be standard output from the system:

   a. Assignable space by function (research instruction, office, rental, etc.),

   b. Facilities by campus or off campus location,

   c. Facilities by organizational unit,

   d. Facilities by function or particular functions,

   e. Facilities by type or particular types,

   f. Facilities by building or particular buildings,

   g. Facilities current fair market value, replacement and original cost,

   h. Facilities by age and acquisition date,

   i. Land by land size, grantor, and assessor number,

   j. Utilization of classrooms, laboratories, and offices.

2. Ad hoc reporting capabilities must be provided that allow a nonprogrammer to interactively define the select criteria, sort sequence and data elements to be reported. Count, total and subtotal capabilities must also be provided.

   An example of an ad hoc reporting need that should be satisfied is "I want to see all the University owned masonry buildings that were constructed prior to 1950; report them in descending order by total area, and print the building number, building name, construction date and total area." The power of this type of capability will minimize the need to predefine all report requirements.

   Mandatory:

   a. Preventive maintenance schedules.

   b. Equipment list by organizational unit.

   c. Facilities by energy requirements.

   d. Equipment list by building.

   e. Equipment list by ID code.

   f. Equipment list containing equipment over a specified dollar amount.

   g. An audio-visual equipment scheduling inventory system is needed by the Office of Communications and Broadcasting. The system should permit on-line scheduling of available equipment and permit the daily preparation of a list of equipment to be delivered and picked up. Such lists require information about the devices required and the office to which the equipment is to be delivered or from which it is to be picked up.

   h. Year-end summaries of audio-visual usage patterns by equipment type and by department/college are required.

   Desirable:

   a. Equipment list by source of funds.

   b. Motor pool tracking by age, mileage, which type, use, energy consumption and maintenance record.

   c. Distribution of equipment by location reports are desirable.

D. Space Assignment

Offices, classrooms, laboratories and other facilities are scheduled for use by the Space Assignment Board for overall identification of facility purpose, by the Registrar for the scheduling of classes, and by the Director of Jot Travis Union for special and short-term events. The contents of facilities records are described in Section V.

1. Data Entry Requirements

a. Each of the offices noted needs on-line access to facilities schedule file to identify whether a given room or set of rooms is available at specific points in time.

b. Modifications to the file should be possible by each office and by the Directors of Public Safety and Facilities to indicate that the building or room is in use, is to be placed in use or is otherwise unavailable for use.

c. Access to the daily and weekly schedule of special events must be available 24 hours a day by anyone with a terminal and adequate knowledge of the system.

d. The capability of modifying facilities inventories and classroom inventories is required.

2. Processing/System Requirements

a. A 12-month projection of special event utilization of facilities is needed for scheduling and assignment purposes.

b. Multi-user access with lock-out is required.

c. A special events file must be kept which maintains easily retrievable data on details concerning the date of an event, the services to be provided, the equipment neede and the charges involved. Charging formulas are available for cost delineation, however, overrides on the charges computed are necessary.

d. A tie-in to the invoicing procedures is needed for those assignments which are charged back to the organization sponsoring an event.

e. Access to the file must be continuous by the Director of the Student Union, although this may be satisfied with daily downloading of a file to a microprocessor.

f. Utilizing the class data records and an instruction room inventory which includes square footage and the number of student stating statistics on usage should be available. Modifications from the original class schedule should reflect courses added, courses dropped, location changes, and modifications in student stations.

3. Reporting Requirements

a. Summaries of events by day, week, month and year (retrospective or forecast).

b. Summary reports of special events space utilization.

c. Reports verifying income from space utilization.

d. Exception reports on unassigned rooms.

e. Utilization reports are needed each semester on classrooms and laboratories.

Utilization is defined as the number of weekly class hours per room, and weekly student hours per station in those rooms as compared with a system standard.

VI. FINANCIAL SYSTEM

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A. Controller's Office

1. Overview

The primary objective of the financial system is to create a comprehensive, flexible system capable of accurately and expeditiously processing input from widely decentralized sources. It must provide expenditure control without the necessity of multiple handling, coding and posting of source documents. It must be capable of handling the volumes associated with current fund expenditures of approximately 133 million dollars annually. This is a total system expenditure.

Detailed annual volumes of the system include the processing of 193,000 accounts payable transactions for which 134,000 accounts payable checks are written. Additional transaction include:

Purchase orders	30,400
Journal vouchers	90,800
Budgets & budget adjustments	23,900
Cash receipts	150,700
Interdepartmental requisitions	103,400
Cash transfers	2,800
Payroll	187,100
Payroll changes	5,900
Travel advances	2,400

The financial accounting system, in general, must:

a. Meet AICPA Audit Guide requirements for financial statements.

b. Meet requirements for control of all University budgets.

c. Be flexible enough to satisfy managerial and accountability requirements at all levels of the University.

d. Adhere to special and ad hoc requirements of agencies external to the University, especially federal.

e. Easily adapt to changing reporting requirements including those of a voluntary nature.

f. Provide ease of maintenance.

Report generation must be provided on a timely basis and must be capable of enhancing financial review, measuring performance and statisfying accountability requirements of managers at all levels.

The financial data base or bases must be sufficiently broad and comprehensive to safisfy specific inquiry and reporting requirements. The ability to react to changing financial demands from both internal and external sources requires timely and accurate output through on-line inquiry, regular operating reports and especially, ad hoc reports. The financial system must provide management with the ability to extract data and reformat it to satisfy unique internal and external requirements.

The system must contain a self-balancing set of accounts consisting of assets, liabilities and fund balances for each fund generally found in an educational institution, namely:

a. current unrestricted funds,

b. current restricted funds,

c. loan funds,

d. endowment funds,

e. plant funds,

f. agency funds.

The system must provide the capability of generating operating statements for certain self-supporting activities such as auxiliary enterprises and internal service centers. The ability to monitor both income and expense and provide expense to income ratios for these activities is mandatory.

A basic requirement of the University financial system must be its capacity to accommodate change. Therefore, the system must be highly flexible in its ability to modify and add data elements without reprogramming the system.

2. Data Entry Requirements

Mandatory:

a. The system must be capable of holding selected transactions for approval by appropriate individuals or offices before the transactions are processed into the data base.

3. Processing/System Requirements

The system must:

a. Provide the capability of reserving funds for any and all commitments entered into the system at the user level. The reservation would be replaced by an encumbrance by the Controller and eventually with automatic liquidation, both partial and final.

b. Be capable of processing transactions against multiple fiscal years simultaneously.

c. Integrate with University budget and human resources systems and interface with other University systems.

d. Include an accounts payable subsystem which provides:

   (1) An on-line vendor file with at least two (2) fiscal years of detail by vendor.

   (2) Cycling of accounts payable and the ability to write data release checks outside the cycle (write check on determined data not immediately in batch and held). Write checks as required.

e. Be capable of meeting the unique accounting, budgeting and reporting requirements of auxiliary enterprises and internal service centers.

f. Provide for project (whether the project is within a fund or encompasses a number of funds), program, cost and sub-cost center accounting.

g. Accommodate an unlimited number of sub-budgets.

h. Perform the check reconciliation process.

i. Provide a daily cash flow statement for a multi-fund, multi-bank situation.

j. Automatically calculate and generate jounral entries.

k. Include a well-defined approach for year-end transition processing.

l. Process and control billings of restricted funds including the aging of accounts receivable.

m. Notify appropriate organizational units of accounting transactions generated by central accounting.

n. Generally, the system should assist in the preparation of cost accounting reports and analyses.

4. Reporting Requirements

Mandatory

The system must include:

a. Comparative reporting of current and prior year activity on both a cash and accrual basis.

b. The standard reports generally found in an educational institution including the Controller's report.

c. Periodic reports as required by the various "letter of credit" systems.

d. Auditable documentation for cost sharing on sponsored agreements.

e. Reporting by project within a fund or across fund boundaries.

f. The capability of reporting financial information for periods outside of the standard University fiscal period (such as contract to date, contract reporting period and contract fiscal year).

g. All authorized administrators should have on-line access to their current budget, up-dated to at least within the last 24 hours and organized by object code.

h. Purchase orders should be initiated on-line with a forms generator screen to simplify data input and to be authorized using user passwords for assurance of approval. Hard copy can be generated locally if desired, but the purchase order should be "moved" to appropriate offices electronically.

i. Department monthly reports organized by object code (individual and aggregate) should display the amount expended per date, the amount budgeted divided by 12 (mo.) and the projected annual expenditure if current rate continues unchanged.

j. Cumulative ledgers by object code are desired for an entire college.

k. Payroll reports indicating the allocation of salary among accounts.

l. The ability to report faculty and staff activity by major function.

m. An exception report giving anticipated current expenditures of current and projected year-end and final comparison expenditures.

n. A simplified personnel costs projection report for professional and classified employees for a given fiscal year is required. This projection should include consideration of fringe benefit projections, modifications in staffing should affect base salaries and fringe benefit projections.

Desirable

The system should provide:

a. The capability of displaying financial data in graphic form to show trends over a period of years.

b. The capability to automatically calculate and encumber indirect costs and fringe benefits.

c. Overall institutional cost data compared to peer institutions should be available on an annual basis.

d. A report which identifies the individual FTE employment status for each faculty member, the courses taught, the credit hours generated, the number of students enrolled and a computed cost per credit hour taught.

B. Research Development

1. Overview

The Office of Graduate Studies and Research processes some 250 proposals annually. Approximately 65 are funded. The University's commitment to research requires that it have a responsive and comprehensive retrieval capability for reporting individual and summary grant information as and when needed.

2. Data Entry Requirements

a. Upon submission of written proposal for submission to an external agency and a fully authorized transmission cover sheet, a record is to be created.

b. The Office of Research must be able to modify the record when a proposal is revised, resubmitted, withdrawn or rejected.

c. A proposal awarded a grant must be accessible by the grants accountant.

d. A proposal record must include:

(1) graduate school number,
(2) account number (if approved),
(3) title,
(4) principal investigator(s),
(5) college/department,
(6) amounts requested, approved by item,
(7) abstract,
(8) agency applied to,
(9) date submitted, received,
(10) date last revised,
(11) sponsor grant number,
(12) start date,
(13) termination date,
(14) link to actual narrative (if on line)
(15) report dates
(16) approvals by department chairperson.

3. Processing/System Requirements

a. Proposals and their related documentation when prepared with system text handling software should be linked to the basic proposal information record.

b. Changes in budget, including the creation of an authorized budget, should be accessible by the Office of Research as well as the grants accounting office and the principal investigator.

c. An historical summary of proposal activity for each fiscal year should be maintained.

d. Access to funding source data bases such as the Foundation Directory are desirable.

e. A faculty interest/research file is desirable for matching RFP's to individuals on the basis of keyword descriptions.

f. A project follow-up facility noting reports due and continuation proposals due dates is needed.

4. Reporting Requirements

a. On-line access should permit summative and individual reports on the completeness of approvals by administrators and review committees (human subjects, laboratory animals, genetic and radioactive safety).

b. Reports summarizing activity by investigator, by department and college, and by agency should be available.

c. Periodic reports indicating interim and final report dates are needed.

d. Access to all data should be provided to the approving offices and the principal investigator.

e. Provision for a standardized "filing" of information about grants and their status is required.

f. Reports on faculty and staff research productivity listing research titles (funded and unfunded) of projects underway or completed in the current academic year should be available by department and college.

g. Reports identifying all grant proposals and their status (funded, rejected, under review) by investigator, by department and college.

h. Reports on actual and projected college and research office receipts for indirect cost recaptures.

C. Research Grant Fiscal Management

Following the pre-grant submission and review of a proposal, the Controller's Office establishes active accounts for fiscal control. The overall system should facilitate this transition for the Graduate Studies Office, the Controller's Office and the principal investigator.

1. Data Entry Requirements

   a. The Controller assigns an account number to a funded project. When this occurs the new account should be traceable to prior records and data.

   b. The adjusted (negotiated) budget authorized should be available on-line to each of the parties.

   c. Approval of an award should trigger written notification of approval to the principal investigator and department chairperson.

   d. Modifications to the file to accommodate budget changes, time extensions and the like should be possible.

2. Processing/System Requirements

   a. The fiscal system should update the accounts payable, position control and personnel systems.

   b. The system should automatically generate indirect cost distributions.

   c. The overall system should assist in auditing and audit defense.

   d. Projects should be definable so that a given project can be organized through the combination of several closely-related, externally and internally funded research and development sources.

3. Reporting Requirements

a. Principal investigators should have on-line access to the status of their grant budget, including purchase order funds reservations and encumbrances.

b. Purchase order status checks should be available.

c. Indirect fund status should also be available.

d. The system should prompt principal investigators and the Controller's Office for reports due.

e. A fiscal report comparable to individual and composite federal reports is required.

f. Current funded project activity should be the basis for future-year projections of activity and of expected indirect cost recovery by college.

D. Budget Operation System

1. Overview

The operating budget system of the University is a management system whose major purposes are: (1) assigns financial and human resources to administrative areas, (2) to provide the basis for financial control of, and accountability for, the use of resources, (3) to coordinate, communicate and rationalize essential resource requirements, (4) to provide perpetual budget records and reports and (5) to provide information for planning and budgetary decision making at all administrative levels.

The University's financial management process depends heavily on the approval of an annual initial operating budget which requires the integration of the operating budget with accounting, personnel and payroll files. It is essential that the University Planning and Budget Office, department offices, dean's offices and other campus offices have real time data which is computer accessible for the management of the University's resources. All departmental budgeting functions should be automated.

2. Data Entry Requirements

The system should have the capability to record program information as a part of the nationally used (NCHEMS) program classification structure.

3. Processing/System Requirements

Mandatory:

a. The system must immediately update the data elements of the central financial accounting system and the central payroll and personnel system.

b. Departmental managers must have the capability to rapidly retrieve and analyze the status of their own budgets.

c. Several simple algorithms must be available within the data base retrieval language for the purpose of analyzing relationships and trends among various budget items.

d. The system must provide a variety of (video) screens at the departmental and college levels for purposes of reviewing budget reallocations, reviewing initial operating budgets and creating the necessary data for input to the budget planning process.

e. Access to department accounts must be restricted to authorized users.

f. Unauthorized alteration of budget data must be prevented.

g. The system must provide programmed controls to validate and/or test all dat to ensure the use of proper codes and levels of data.

h. The system must be able to dynamically utilize the data elements of the student system files.

i. Control features must be provided so the budget can not be entered into the Financial System until the budget is accurate, complete and approved.

j. The system must provide an audit trail of budget transactions.

k. The system should readily accommodate change.

l. Departments and colleges should be able to list their budgets by object code so that expenditures of comparable types can be analyzed and used for forecasting following fiscal year budgets. This would allow a college, for instance, to check total travel expenditures by department, or subscriptions to journals.

Desirable:

a. The system should link student workload data and instructional workload activity data with the central accounting and payroll systems.

b. The system should provide for full cycle budget planning using, for example, FY 83-84 budget income and expense line items and applying percent increases or decreases to generate actual dollar changes systematically to produce the fiscal year 84-85 budget.

c. Budget data through the use of a matrix should permit automatic distribution of annual amounts of income and expense categories across 12 months for use in financial reports. Budgets should be of two types, those that can exceed month-by-month levels and those that cannot.

d. The budget system should be capable of accumulating budgets from selected cost centers to produce summary budget reports in various configurations.

e. A department should be able to list travel expenses to date for individuals.

4. Reporting Requirements

Mandatory:

a. All operating budget reports must be made available to authorized financial officers, department heads and central budget analysts in the form of video display screens.

b. An efficient, rapidly retrievable, historical data base going back at least two years must be available as a by-product of the transactional budget system so as to provide the analytical tools for monitoring expenditure trends and deviations.

c. Unauthorized requests for reports must be denied and logged by the system.

d. Standard reports must be available on microfiche so historical hard copy can be maintained for adequate control, audit capability, and operational and planning needs.

Desirable:

a. Ad hoc reporting features should be provided to enable non-programmers to interactively define report requirements.

E. Budget Planning System

1. Overview

The University budget planning system is a complete management system whose major purposes are: (1) to facilitate planning and analysis, (2) to translate planning directions into resource allocation decisions, (3) to assign administrative responsibility for resource management, and (4) to serve as a catalyst for the reallocation of University resources.

The University depends heavily on the planning and budget process which in turn requires the integration of fiscal, manpower, student and facilities information. It is essential that the University budget office have computer-accessible data to aid the management of the University's resources. Paper should be eliminated as a primary vehicle for communicating analyses and should be replaced by interactive on-line modeling, simulation and optimization software. These tools must be readily accessible to budget executives and administrators for planning future resource assignments and allocations.

2. Data Entry Requirements

Mandatory:

a. The system must provide dynamic access to the data elements of the financial, human resources, student and facilities system files.

b. The budget planning system must be on-line and interactive.

c. At the time of the budget planning process the system must allow departments to enter updated current-year budget as a base for a projected budget. Automatic aids for updating classified salaries, adjusting fringe benefits when salaries change, etc.

d. Budget items and allocations approved as a one-time appropriation (not to increase the base budget) should be deleted when a projected budget is being developed.

e. Specific data entry identification by individual should be designed into the system.

This will permit the Budget Office and/or the Controller's Office the prerogative of selecting, under program control, specific individuals to enter budget data. In some cases only the financial officer in each administrative unit would be so permitted.

3. Processing/System Requirements

Mandatory:

a. Several simple algorithms must be available within the data base retrieval language for the purpose of analyzing relationships and trends among various budget items.

b. The system must provide a variety of video screens at the departmental level for purposes of analyzing budget reallocations and initial operating budgets and for creating the necessary data for input to the budget planning process.

c. Historical summary data (for a minimum of five years) must be kept with the attendant capability of calling statistical routines to analyze historical trends and project future trends by category of expenditures, tuition fees income and departmental income.

d. Budget data must be linked through a crosswalk table with course and program activities -- including instruction and research.

For example, it must be possible to link faculty on a certain budget with their actual teaching activites - courses, sections, etc. and to calculate costs. Conversely, it must be possible to relate courses and programs with faculty activities and with instructional costs.

e. A capability to segment budgets by programs for purposes of cost and benefit comparisons of these programs with possible alternative programs with the same budget must be provided.

f. Program budgeting must be provided to all administrative units and for the University as a whole.

g. Analyses of financial, faculty, student and facilities data must be provided with selective features for comparing productivity among colleges and departments (e.g., cost per student credit hour, FTE faculty per FTE student, ratios of various budget categories one to another).

4. Reporting Requirements

Mandatory:

a. Budget reports used in planning the budget must be made available to financial officers, department heads and central budget analysts in the form of screens on the video display terminals (and hard copy output as desired).

b. All standard analytical reports required for support of the appropriation requests, the five year planning and budget review process, academic program cost studies and external reporting must be provided.

This capability must be available in a "user friendly" mode whereby a budget analyst, planning analyst, financial officer, department head or campus director without assistance from a professional computer programmer can retrieve any standard or ad hoc report desired.

c. The system must provide the capability to aggregate expenditures in specific object classes across administrative units.

d. Historical summary data (for a minimum of five years) must be available (not necessarily on-line) with the attendant capability of calling statistical routines to analyze historical trends and project future trends by category of expenditures, tuition and fess income and departmental income.

e. A college should be able to project average credit hour loads per faculty member given variable credit load among the faculty of that college.

F. Miscellaneous Stores

1. Overview

The University of Nevada Reno operates a Central Stores service to provide user department at five campuses (Truckee Meadows, Western Nevada and Northern Nevada Community Colleges, Desert Research Institute and UNR). The service provides quick access to commonly used office supplies and equipment while accomplishing centralized bulk purchasing and inventory control. The Central Stores inventory consists of approximately 600 items totaling approximately $40,000. An average of 3,500 requisitions (with an average of eight line items per requisition) are processed each year totaling approximately $250,000. The number of receipts total approximately 200 per year with approximately ten line items per receipt.

The Central Stores system must (1) provide customers with an on-line capability for ordering inventory items, (2) provide an interface with the financial system to automatically charge the user's budget and (3) provide the Purchasing Department with efficient access to information that will assist in the effective management and control of the inventory.

In addition to Central Stores, there is a Film Stores service in the Office of Communications and Broadcasting and a Chemical Stores in the Chemistry Department which function in a manner similar to the Central Stores facility. Central Services also acts as a store by providing paper, ink and other supplies to departments in addition to the use of such materials in printing.

2. Data Entry Requirements

Mandatory:

a. Requisitions must be entered and processed on-line by properly authorized users; users must be allowed to encumber only their own budgets.

b. A set of on-line data maintenance functions must be provided but restricted to use by Central Stores and Purchasing personnel. Examples of required functions include: item add, item delete, item description change, quantity and value adjustments, reorder point change, price changes, stock number changes, returns to inventory, credits and receipts, and source changes.

c. Editing and validation of data including batch totals must occur at the time of data entry; easily understood error messages must be returned to the originator specifying why the erroneous data is not acceptable.

3. Processing/System Requirements

a. The system must price the requisition at the time of entry and the system must reject a requisition if the funds are unavailable in the user's budget. If the funds are available the system must enter an encumbrance against the user's budget.

b. Immediately following the successful entry of a user's requisition a priced picking slip must be printed or available for printing at Central Stores.

c. Following delivery of the requisitioned items, Central Stores personnel must have an on-line capability to adjust and/or remove the encumbrance against the user's budget and automatically execute the transfer of funds from the user's budget to the Central Stores budget.

d. When a user requests an item that is out of stock, the user must be given the opportunity to place a back order.

e. The system must automatically fill back orders when new material is received.

f. A record of inventory that is currently on order (from suppliers) must be maintained.

g. Historical usage and price data must be maintained by the system to support purchasing decisions by item for the past fiscal year.

h. Inventory items must be identified by inventory category; the system must allow a minimum of 99 categories; an item should be allowed to be included in alternate categories.

i. The new item selling price must be calculated upon receipt of new inventory. At a minimum the system must calculate the selling price based on the average cost multiplied by a mark-up factor (with allowance for different mark-up costs for different items).

j. The system must allow items to have more than one order unit (e.g., boxes and each) and provide for the conversion of one order unit to the other.

k. Warehouse locations of items should be identified.

l. Analytical tools should be available to assist in determining reorder points and order quantities based on cost, quantity discounts, historical usage and order lead times.

m. The system should allow an item number to be changed without losing any data associated with the item.

n. The system should provide an on-line catalog of inventory items with access by keyword.

4. Reporting Requirements

a. Orders generated by department should also generate picking slips at Central Stores.

b. When orders cannot be filled in their entirety, adjustments need to be made in user accounts for partial or unfilled orders.

c. A current catalog listing, printed and on-line, must be provided for user departments to use when ordering.

d. Physical inventory and variance reports must be provided.

The physical inventory report is used by the stock-room clerk to record the physical count of the inventory. The report must not contain the inventory quantity from the data base. Physical inventory counts must be used to generate a variance report.

e. Periodic summaries of inventory status and activities must be provided.

Reports must show number and percentage of items out of stock, beginning and ending inventory value by category, sales, cost of goods sold, gross profit/loss, back order summary, annual turnover rates, etc.

f. Reorder reports must be provided to notify the buyers of items that have fallen below the reorder point.

g. A detailed inventory status report showing data on each individual inventory item must be provided.

h. The system must periodically provide a complete audit trail of inventory transactions on microfiche.

The audit trail must have a section listing all transactions by item number that changed the inventory data base other than sales and receipts (e.g., new items, quantity adjustments and deleted items). A section of sales by requisition number, receipts by purchase order number, and sales and receipts by item number must also be provided.

G. Purchasing System

1. Overview

The Purchasing Department has the responsibility to secure materials and services from vendors and to comply with applicable University, State and federal purchasing policies. The Department processes approximately 15,000 purchase orders and 20,000 Limited Purchase Orders each year.

The objectives of a purchasing system are to:

a. speed up the processing of a purchase requisition.

b. allow the originator of a purchase requisition to easily and quickly determine the status of a purchase requisition.

c. eliminate the need for a paper purchase requisition form.

d. control Limited Purchase Order processing.

e. allow only properly authorized users to enter a purchase requisition on-line.

f. provide electronic file transfer capabilities to forward the requisition to the proper administrative offices for approval and reservational of funds (if necessary), and then to Purchasing.

g. enable a department which completes a purchase order, to reserve funds in the user department's budget before action is taken by Purchasing and before a formal encumbrance is made by the Controller.

h. allow the originating department to suggest a vendor and Purchasing to select the appropriate vendor and to create a Purchase Order.

i. provide the originating department with the capability to inquire about the status of a Purchase Order and to notify the Purchasing Department and Accounts Payable when the products are received by the user campus/department or by Central Receiving at UNR. Status inquiries using the purchase order number, the department requisition number or the department name would indicate whether items have been authorized at higher levels and if ordered what the price is, who the vendor is, whether the order has been split, or whether the order has been received.

j. allow the Purchasing Department to increase or decrease the amounts encumbered by a Limited Purchase Order or a Purchase Order before or after the estimated price has been encumbered.

k. pre-screen for items ordered which are $500 or more and for authorizations for federally-funded purchases by the Inventory Control and by the Grants and Contracts Office.

l. allow Accounts Payable to authorize payment, including partial payment, to the vendor, liquidate the encumbrance and charge the originating department's budget.

m. notify equipment inventory when an inventoriable item has been received.

2. Data Entry Requirements

a. User department and Purchasing must be able to enter a purchase requisition on-line for multiple accounts and multiple years.

b. The system must provide on-line procedures for purchase requisitions to be reviewed according to policy and either approved or disapproved.

c. Purchasing must have exclusive access to an on-line procedure to create a Purchase Order based on a purchase requisition.

d. Users must be restricted from entering purchase requisitions for budgets other than their own.

e. Purchasing must be able to modify user purchase orders including commodity codes and account numbers.

f. Users must have an on-line capability to notify Purchasing, Accounting and Inventory Control when products are received.

g. The system must indicate when a purchase order, or when Limited Purchase Order, has been issued without going through Purchasing or the Controller's Office.

3. Processing/System Requirements

a. The system must refer a purchase requisition to the Grants and Contracts and to Inventory Control, if necessary, for approval and encumbrance prior to being forwarded to Purchasing.

b. The system must be capable of handling Purchase Orders which are non-University-funded and which are not, therefore, entered into the University's accounting system.

c. The ability to identify vendor characteristics such as minority, small business and in-state business must be provided.

d. The ability to categorize purchased items by commodity code (e.g., office furniture, paper supplies and scientific glassware) must be provided.

e. A complete 2-year history of purchase order must be maintained on-line for reporting purposes.

f. The originator and Purchasing must be able to enter comments or instructions with a purchase requisition.

g. The system must indicate when a purchase requisition is out for bid and when a purchase order(s) has been issued or when part of a purchase order has not yet been issued.

h. Display all information for one requisition order when one or more purchase orders have been issued.

i. The system should provide the ability to associate a vendor with specific commodities. For example, the system should be able to provide a list of scientific glassware vendors.

j. Data on purchases by vendor, by purchase order number, by department, and by requisition number should be maintained for the previous five years.

k. Data should be maintained on vendor performance and status. The system should have the capability to call attention to a vendor who performs poorly.

l. Data should be maintained on quotations and bids.

m. Data should be maintained on vendor contracts.

n. Quotes on purchase orders should be kept on file and available.

o. Vendor hard copy purchase orders should be produced when desired and on all orders over $500.

p. The system should provide easy, direct entry of quotes connected to specific purchase orders with automatic data entry (date, terms, etc.) as possible.

q. A Master Vendor File available to Purchasing and Accounts Payable should provide vendor characteristics.

r. The Purchasing Department only must be able to change or cancel orders and simultaneously reverse encumbrances.

s. The system must provide a purchase order routing procedure with override potential.

t. A quick payment release, "check with order", procedure must be implemented to allow prepayment or sole source payment.

u. The system should automatically assign a non-duplicate purchase order number. Change version fields for purchase orders should be available.

v. The system should insure that data on cancelled purchase orders is not lost from the system.

4. Reporting Requirements

a. The originating department and the Purchasing Department must be able to display or report the status of all outstanding purchase orders and blanket purchase orders.

b. Periodic summaries of purchasing activity must be provided.

Reports must show the number and value of Purchase Orders, quotation and contracts by commodity code, buyer, etc. compared to the previous period and the same period last year.

c. "Volume of business" reports for vendors should be provided.

d. A report of any purchased equipment item exceeding $500 and other inventoriable items should be provided for equipment inventory.

e. A report of Purchase Orders that have passed the expected delivery date by an established period of time should be provided. The system should allow for follow-up commentary. Call-up should be by purchase order number, requisition number or department.

f. Blanket purchse order searches should be provided to identify existing contracts by commodity and department.

g. Hard copies of all documents should be available at any point from authorization by a department to issuance of an order.

H. Central Services and Publications and Graphics

The University provides printing and reproduction services through the Office of Central Services and graphics assistance through the Office of Publications and Graphics. Central Services processes around 4,000 work order and Graphics processes around 600 work orders each year.

1. Data Entry Requirements

a. All outgoing mail is processed and required postage is added by Central Services. The proposed system should accommodate the inclusion of the current postage meter system to provide direct billing to user accounts. Accounts are currently designated by the addition of four digits to the zip code.

b. Much of the activity in Central Services and Graphics is initiated with a work order used both for estimating a job cost and for preparing the actual bill or interdepartmental requisition for reimbursement. Billings are based upon time and materials. The creation of work orders should be assisted by a menu driven, computer-generated form which automatically assigns log-in number, a date, etc. and aids the supervisor in completing the form accurately.

c. A job re-run should be facilitated by the duplication of data in the original work order.

2. Processing/System Requirements

a. Interdepartmental charges for printing, Xeroxing, mailing, graphics, etc. should be entered on-line for transfer.

b. An inventory of the several thousand sizes and types of paper, inks and other materials should be available.

c. Billing and accounting for Graphics and Central Services should be combined.

d. Data on work sheets, pending and completed, must be retrievable by log-in number, department/college, account number and job type.

e. All work orders should be modifiable after entry into the system.

f. Central Services should have access to the mailing lists of other University departments.

3. Reporting Requirements

a. Statistical summaries of production to-date are needed by job type, department/college and account number and should include data on major cost elements (time and materials).

b. Computer output directly to typesetting equipment is desirable. Also direct transfer of high resolution graphics to transparency or print media is desirable.

c. Reports and displays should provide identification of Change Work Orders, Blanket Purchase Orders, regular Purchase Orders, change order to existing Purchase Order, Blanket Purchase Order or Change Work Order, level of effort, time and material, cost reimbursable.

d. Displays should provide department with the ability to determine if Blanket Purchase Order was in existence previously and the number/Change Order assigned to this order.

e. Maintenance Contracts should be displayed with serial number of machine, equipment vendor involved, location of equipment and vendor name.

f. Reports should provide departments operating under cost reimbursable contract vs. grants, to have traceability of cost, by cost element and purchase orders, by Task Order numbers (i.e., Desert Research Institute, Job Corps, Mackay Mines).

I. Police and Parking

1. Data Entry Requirements

a. A rapid means of updating parking (sticker) records for the 11,000 cars with authorization to park on campus is essential.

b. A rapid means of entering traffic citations is required to handle the average of 300 citations issued each day.

c. An on-line method of entering and, to the extent possible, editing of data through a pre-designed screen should facilitate the entry of crime report data.

d. Crime report data should be modifiable on-line.

2. Processing/System Requirements

a. The system should automatically enter holds into the student records system 35 days after a citation is issued if it has not been cleared, and the hold should be removed when a fine is paid or when an appeal is granted.

b. On-line searches using key fields and intra-fields, word searches should be available.

3. Reporting Requirements

a. Notices of outstanding violations should be generated each semester to students and staff.

b. A listing of all outstanding violations should be prepared on request by license number and by individual.

c. Terminal displays of an individual's outstanding citations with an explanation thereof should be available on inquiry by the Parking Office.

d. Reports of the type required by the Police Department include:

(1) Displays of all felony assaults by month and year.

(2) Displays of all misdemeanor cases committed by area and by date.

(3) Displays of all cases with a victim or suspect.

(4) Statistical summaries of crime by type, area and time.

(5) Statistical summaries of traffic accidents by area and time.

(6) Statistical summaries of miscellaneous crimes, casualty cases, vehicle cases and missing persons cases by frequency and area.

(7) General reports which list all victims in the year-to-date, vehicles involved in crime cases, suspects for the past year, and felonies by area and time.

VII. PERSONNEL, PAYROLL AND POSITION SYSTEM

VII. PERSONNEL, PAYROLL AND POSITION SYSTEM

A. Personnel, Payroll and Position

1. Overview

A University human resources information system is required to provide administrators at various levels in the organization with the information necessary to make relevant decisions regarding faculty, staff, clerical and technical service personnel. The system must be constructed as an integrated data base linking payroll to personnel to budget to accounting functions.

The University of Nevada Reno employes approximately 1,550 full-time classified and professional employees and a large number of part-time faculty and staff. The Personnel and Payroll System must also provide access to personnel information for prompt creation of management information.

The primary objective of the Personnel, Payroll and Position System is to provide a timely and accurate shared data base that serves the operational and information needs of a variety of organizations within the total University.

The second objective is to provide on-line data access and maintenance which will minimize the amount of paper generation and handling while maintaining adequate controls. On-line interaction must be simple and easily managed. Security must be provided to restrict user's data access and maintenance capabilities.

The third objective is to provide a flexible and easily maintained system in order to be responsive to mandated internal and external changes and reporting requirements.

2. Data Entry Requirements

a. Data entry and maintenance must be primarily on-line with easily managed user prompts and data entry screens.

b. The system must allow data to be entered at specific locations and retrieved by the appropriate administrative offices for approval prior to updating the data base.

c. The system must perform editing and validation at time of original entry. Easily understood error messages must be returned to the originator specifying why data is not acceptable.

d. The system must process on-line, batch and tape input of all payroll transactions.

e. Exclusive data maintenance responsibility for position control must reside with the budget office. Security features must ensure that budgetary officers can control, add, modify or delete positions in their area only.

f. Data entry must be coordinated among administrative areas, Personnel Office, Payroll Office and financial officers.

g. Many aspects of the personnel, payroll and position systems allow for several approaches to the handling of a given problem. For instance, there are several retirement plans in effect and there are a variety of optional deductions. The systems employed need to accommodate all of these variations.

3. Processing/System Requirements

Mandatory:

a. An on-line capability must be provided that will accept dated transactions but will not update the files until the date specified.

b. A negative on-line time entry for both daily or hourly rates to deduct for excessive time off must be available to the Payroll Office.

c. All payroll deductions must be printed on the check stub including total to-date cumulative deductions. The check stub should also note leave accumulations.

d. The system must provide for retrieval of information by position and be able to identify the department and subdepartment.

e. An historical record of each position number must be readily available.

f. Each position must have classification, FTE, grade, title, EEO category data, encumbrance level and source of funds information.

g. Three years of payroll data for fiscal and calendar year conversions must be available on line.

h. The system must be capable of paying retroactive payrolls scheduled at any time for all classes of employees.

i. The system must be capable of proper calculations and deductions for checks that cover multiple pay periods and from multiple accounts (funding sources).

j. The system must interface with the payroll distribution and effort reporting functions with an automatic transfer of data from the payroll data base to other data bases.

k. The system must be capable of paying withheld taxes and other deductions to various taxing jurisdictions.

l. Current biographical data for all employees must be maintained.

m. All data for terminated, deceased and retired faculty and staff must be retained for three years. This data need not be kept on line.

n. The system must maintain home and campus addresses, phone numbers, rank and title of all employees.

o. Calculations of premiums for insurance carriers must be performed.

p. Tax deferred annuity information must be maintained.

q. An historical record of five years of data for all full and part-time faculty and staff members must be automatically maintained and updated which records all contractual changes, promotion and tenure actions, courses taught, merit pay and longevity salary increments, etc.

r. Routine salary adjustments as a result of step plan movement for clerical and technical service, and staff on training progressions must be automated with an audit trail and a one month advance notification of expected salary adjustments.

s. The payroll system must be sufficiently flexible to allow inclusion of existing and unanticipated forms of deductions, as well as changes to deduction tables.

t. The system must track and provide periodic reports on upcoming work evaluation, tenure review, payroll reports and certain other payroll transactions.

u. Dependents' names and dates of birth must be maintained.

v. The system must readily adapt to changes in payroll schedules (i.e., frequency of payment).

w. The system must be able to identify student employees.

x. Flexibility to adjust to future mandated requirements from OSHA and state and federal agencies must be provided.

y. Leave of absence data -- with and without pay, reason, length, begin and return dates must be provided.

z. Centralized maintenance of absence and leave records such as vacation, sick leave, funerals and jury duty should be provided which allow dispersed data entry, but aggregated reporting for the campus by administrative unit.

aa. Inquiry by name in addition to Social Security number and identification card should be provided. The system should allow for name changes and changes in Social Security number.

bb. The system should allow for multiple incumbents for a single position and to allow for a single person being involved in more than one employment category, perhaps split among more than one system unit.

cc. Data on current positions within a given University unit should be available for the preparation of projected budgets.

dd. Position control files should be up-dated automatically by payroll and personnel record up-dates. An interface with the general ledger is also needed.

ee. Direct deposit options for salary payments should be permitted.

ff. Retrospective changes in salary and fringe benefits should be permitted.

gg. Multiple payment schedules should allow for the issuance of checks in varying time cycles.

hh. An unlimited number of deductions should be provided for each individual.

ii. All payroll expenses should be distributed to projects, departments and other cost centers as desired.

jj. The system should allow for both positive and exception time reporting.

kk. The system should be capable of issuing payroll checks between pay periods.

ll. Automatic, as well as manual, preparation of checks should be provided for.

Desirable:

a. An annual statement of benefits for faculty and staff to include retirement information, insurance,

hospital, surgical, major medical, vision and dental programs should be provided.

b. Automated billings for benefits for employees on leave without salary and fixed term appointments eligible for benefits during their terms off should be provided.

c. An applicant tracking system which supports the matching of applicants with appropriate qualifications with vacant positions is desirable.

   This system should provide a log-in of an application form, the dates at which required data was received for inclusion in an applicant's folder, and a record of the positions for which the individual was considered. Data on referral sources should be kept to permit the evaluation of promotional media used.

d. The determination of an employee's eligibility for unemployment compensation should be provided including the amount and length of the benefit.

e. An inventory of research and development interests for full- and part-time faculty and staff should be maintained. This file should be accessible by the offices of research, public information and individual departments.

f. The data noted immediately above should be relatable to individual faculty vita, grant productivity data and committee assignments to summarize faculty information by individual for program review and individual evaluation purposes.

g. Exit interview and other termination data on reasons for the loss of professional and classified employees should be kept for analysis.

h. A procedure for assessing the individual impact and the departmental impact that the phased retirement of a faculty member would have would be beneficial.

4. Reporting Requirements

Mandatory:

a. Each college or administrative area must have on-line retrieval capabilities for their areas of responsibility only.

b. Security features must ensure the integrity of the total system.

c. Standard and one time reports must be available on a demand basis through on-line requests.

d. Major emphasis must be placed on ad hoc reporting features that allow a non-programmer user to interactively define report requirements to meet the management information needs of a variety of users.

These reports, studies and comparisons would be by work unit, discipline, department or college yearly or multi-year on a variety of data such as tenure versus non-tenure, awards and denials, ages, faculty ranks, salaries, new appointments, mixes of ranks, turnover, classification category, leaves of absences, approvals versus non-approvals versus eligibility, grades of positions, evaluation factors and degrees, length of service, place attainment on salary schedules, benefits plans, etc.

e. Mandated standard state and federal reports on affirmative action, EEO and FLSA must be provided.

f. Classified employees who work more than 40 hours per week must be reported, distinguishing between those persons paid straight time and those persons being paid time-and-a-half.

g. A report of all part-time student employees who have worked more than a given number of hours for the year must be provided.

h. The system should allow for variable withholding rates, including state tax withholding for out-of-state residents, such as court judges affiliated with the Judicial College.

i. Employee history reports including salary must be provided.

j. A report of part-time employees who have worked a designated number of hours in a calendar year must be provided.

k. Address labels showing office or home address must be provided. These labels must be able to be printed for selected individuals. Other selected data elements should be optionally printed on the label.

l. Overtime, shift differential, holiday pay and holiday overtime reports periodically and year-to-date must be provided.

m. Reports on dates by which professional evaluations for tenure and classified employee evaluations for merit pay and normal review are required, as are promptings on longevity pay increases.

n. Reports identifying the number of full-time and letter of appointment faculty is needed periodically. The report should break down the part-time faculty by number of credits taught.

o. Initial contracts and contract renewals should be prepared, with updated salary information, automatically.

p. College and institutional data on graduate assistants is essential.

q. A report comparing authorized staffing plans with actual staffing patterns is required.

r. Five-year trend reports on staffing by department and college is needed. This would include the current year and the projected staffing for the next fiscal year.

s. Exception reports noting variances from planned budget allocations are required.

t. Wage and salary analyses by department and college is required.

u. A report supporting the evaluation of salary equity within and among departments is required.

v. Data on individual applicants should be available on-line.

w. A salary savings report on positions not being filled should reflect fringe benefit savings also.

x. A report on all vacancies within the year to date, and a report on all vacancies at a given point in time are required.

y. Detailed and summary deduction reporting are needed.

z. Complete tax reporting and withholding statement preparation are required.

aa. On-line inquiry into each person's payroll records should be possible at the Personnel Office.

bb. Budgetary position control functions should be supported by faculty activity analysis reports.

cc. Time and effort report forms by selected groups of employees should be prepared for reconciliation with actual pay records.

dd. Reports should be available which identify each person and the accounts used to subsidize that person's position. This would include multiple accounts (federal, state, other sources) and non-synchronous fiscal years used by the funding services.

Desirable:

a. A report of unemployment compensation expenditures by college (or administrative area) and department should be provided.

b. Salary survey reports comparing University salaries with the local market should be provided.

c. Jobs filled reports that includes internal promotion, demotion, transfer and new hires should be provided.

d. Salary equity reports comparing salaries paid for comparable level professional positions should reflect unit-by-unit averages.

h. The College of Education needs to maintain a list of qualified cooperating teachers based on completion of training and past service to the University.

i. A report noting turn-over by department and college over a five year period is desirable.

B. Affirmative Action

1. Data Requirements

a. All personnel and student data entered in the system should include reference to standard affirmative action categories (ethnicity, sex, handicapped or international).

b. A facility for entering 150-200 active resumes or selected data on minority candidates into electronic files for rapid retrieval would be useful.

2. Processing/System Requirements

a. A procedure for maintaining historical files on complaints and disposition of complaints regarding sexual harassment and discrimination needs to be kept.

b. A procedure for maintaining historical files on compliance reviews including applicant information, incidents of non-compliance and interim agreements.

3. Reporting Requirements

a. Most reports used need to be reported out using both HEGIS guidelines for federal reports and institutional guidelines for local use reports.

b. Reports on undergraduate and graduate students and staff indicating the distribution of minorities, women, handicapped, etc. by department, college and campus are required.

c. A breakdown of comparable groups' representation in graduate education (applicants, matriculants, graduates, graduate assistants) are required.

d. All reports should match actual distributions with institutionally adopted goals.

e. A report listing the services and amounts of federal aid that would be lost if compliant status was jeopardized is desirable.

f. A report summarizing the responses to position vacancy notices in various publication is desirable.

g. A professional recruitment tracking report should identify the numbers of applicants, acceptances/rejections and follow-up information on the reasons for professionals to accept or reject employment.

APPENDIX A: PEOPLE INTERVIEWED

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PEOPLE INTERVIEWED

Name	College/Dept.
Alice Ballantine	- Education
R. C. Barnes	- Business Administration
Roberta Barnes	- Dean of Student Services
Alison Benson	- Financial Aid
Connie Bernhardt	- Career Planning & Placement
Suzanne Brooks	- Affirmative Action
Gary Brown	- ASUN Manager
Jan Brown	- Institutional Studies
Sandy Cardinal	- Payroll
Sally Carothers	- Student Services, JTU
Patty Chambers	- School Relations
Jack Clarke	- Counseling and Testing
Ann Collins	- Purchasing
Ada Cook	- Special Programs
Joseph Crowley	- President
Richard Dankworth	- V.P. Public Affairs
Richard Davies	- V.P. Academic Affairs
Ashok K. Dhingra	- V.P. for Finance & Administration
Edwin Dodson	- Education Administration
Donna Beth Downer	- Dean of Homes Economics
Neal Ferguson	- Dean of Continuing Education
Randall Frost	- Job Corps Center
Karen Garell	- Student Services, JTU
David Hansen	- Student Services
Pharbus Harper	- Purchasing
Steve Harrison	- Development, UNR Found.
Edward Higgins	- Inventory/Purchasing
Andrea Hillmeister	- Arts & Science Administration
Dianne Holt	- Career Planning & Placement
Richard Hughs	- Dean of Business Administration
James Jeffers	- Purchasing
Robert Jeffers	- Personnel
Bernard Jones	- Dean of Agriculture
Robert Kinney	- Student Services
Owen A. Knorr	- Institutional Studies
Virginia Kersey	- Budget
Peter Krenkel	- Dean of Engineering
Joel Lanphere	- Medical School
John Marschall	- Director, University Services
Marianne Martin	- Information
Penny McCarty	- Education
Carolyn McGrane	- Personnel
Laura McMahon	- Personnel
Bob McQueen	- Scholarships
Barry Meyers	- Grants & Contracts

Frank Meyers	- Dean of Education
Claudia Miner	- Research Development
Harold Morehouse	- Library
Shirley Morgan	- Housing Services
John Nellor	- Dean of Graduate School
Paul Page	- Dean of Arts & Science
Dan Pease	- Financial Services
Pete Perriera	- Director, Student Union
Gayle Pyle	- ASUN
Viginia Rassuchine	- Admissions & Records
Joanne Ray	- Personnel
Charles Records	- Admissions & Records
Art Roberto	- Controller
Sandi Sagers	- Financial Aid
Cecilia St. John	- Alumni Relations
Steve Salaber	- Cashier
John Schuon	- Central Services
Marion Schrum	- Dean of Nursing
Therese Selden	- Financial Aid
Carl Shad	- Purchasing
Jack Shirley	- Director of Admissions, Registrar
Keith Shumway	- Chief of Police
Rita Smith-Kindred	- Student Placement
Norm Starrett	- Purchasing
James Taranik	- Dean of Mines
Ruth Tavernia	- Personnel
Daniel Tone	- Communications & Broadcasting
Vada Trimble	- Housing Programs
Barbara Uriu	- School Relations
Tracy Veach	- Medical School
Brian Whalen	- Physical Plant
Harry Wolfe	- Career Planning & Placement